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 Glu Asn Ala Ala Ile Ala Pro Ser Ala Leu Val Gly Thr Glu Thr Gly
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 Pro Ser Val Gly Ala Gly Arg Ile Ser Tyr Ala Leu Gly Leu Arg Gly
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 His Leu Ala Cys Gln Ser Leu Arg Ser Gly Glu Cys Ser Thr Ala Leu
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- 20 -

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Leu Ile Asp Lys Ser Phe Asn Leu Leu Arg Ser His Gly Arg Phe Val
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- 23 -

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Ile Glu Ile Ile Asp Leu Arg Gly Leu Asp Arg Ser Thr Arg Glu Ala
145 150 155 160

Arg Leu Val Ser Leu Arg Asp Ala Met Ser His Arg Ile Tyr Asp Thr
165 170 175

Glu Arg Pro Pro Leu Tyr His Val Val Ala Val Arg Leu Asp Glu Arg
180 185 190

Gln Thr Arg Leu Val Leu Ser Ile Asp Leu Ile Asn Val Asp Leu Gly
195 200 205

Ser Leu Ser Ile Ile Phe Lys Asp Trp Leu Ser Phe Tyr Glu Asp Pro
210 215 220

Glu Thr Ser Leu Pro Val Leu Glu Leu Ser Tyr Arg Asp Tyr Val Leu
225 230 235 240

Ala Leu Glu Ser Arg Lys Lys Ser Glu Ala His Gln Arg Ser Met Asp
245 250 255

Tyr Trp Lys Arg Arg Ile Ala Glu Leu Pro Pro Pro Thr Leu Pro
260 265 270

Met Lys Ala Asp Pro Ser Thr Leu Lys Glu Ile Arg Phe Arg His Thr
275 280 285

Glu Gln Trp Leu Pro Ser Asp Ser Trp Gly Arg Leu Lys Arg Arg Val
290 295 300

Gly Glu Arg Gly Leu Thr Pro Thr Gly Val Ile Leu Ala Ala Phe Ser
305 310 315 320

Glu Val Ile Gly Arg Trp Ser Ala Ser Pro Arg Phe Thr Leu Asn Ile
325 330 335

Thr Leu Phe Asn Arg Leu Pro Val His Pro Arg Val Asn Asp Ile Thr

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340										345										350									
Gly	Asp	Phe	Thr	Ser	Met	Val	Leu	Leu	Asp	Ile	Asp	Thr	Thr	Arg	Asp														
	355						360								365														
Lys	Ser	Phe	Glu	Gln	Arg	Ala	Lys	Arg	Ile	Gln	Glu	Gln	Leu	Trp	Glu														
	370						375								380														
Ala	Met	Asp	His	Cys	Asp	Val	Ser	Gly	Ile	Glu	Val	Gln	Arg	Glu	Ala														
	385						390								400														
Ala	Arg	Val	Leu	Gly	Ile	Gln	Arg	Gly	Ala	Leu	Phe	Pro	Val	Val	Leu														
			405						410						415														
Thr	Ser	Ala	Leu	Asn	Gln	Gln	Val	Val	Gly	Val	Thr	Ser	Leu	Gln	Arg														
			420						425						430														
Leu	Gly	Thr	Pro	Val	Tyr	Thr	Ser	Thr	Gln	Thr	Pro	Gln	Leu	Leu	Leu														
			435						440						445														
Asp	His	Gln	Leu	Tyr	Glu	His	Asp	Gly	Asp	Leu	Val	Leu	Ala	Trp	Asp														
			450						455						460														
Ile	Val	Asp	Gly	Val	Phe	Pro	Pro	Asp	Leu	Leu	Asp	Asp	Met	Leu	Glu														
			465						470						480														
Ala	Tyr	Val	Val	Phe	Leu	Arg	Arg	Leu	Thr	Glu	Glu	Pro	Trp	Gly	Glu														
									485						495														
Gln	Val	Arg	Cys	Ser	Leu	Pro	Pro	Ala	Gln	Leu	Glu	Ala	Arg	Ala	Ser														
									500						510														
Ala	Asn	Ala	Thr	Asn	Ala	Leu	Leu	Ser	Glu	His	Thr	Leu	His	Gly	Leu														
									515						525														
Phe	Ala	Ala	Arg	Val	Glu	Gln	Leu	Pro	Met	Gln	Leu	Ala	Val	Val	Ser														
									530						540														
Ala	Arg	Lys	Thr	Leu	Thr	Tyr	Glu	Glu	Leu	Ser	Arg	Arg	Ser	Arg	Arg														
									545						560														
Leu	Gly	Ala	Arg	Leu	Arg	Glu	Gln	Gly	Ala	Arg	Pro	Asn	Thr	Leu	Val														
									555						570														
Ala	Val	Val	Met	Glu	Lys	Gly	Trp	Glu	Gln	Val	Val	Ala	Val	Leu	Ala														
									580						590														
Val	Leu	Glu	Ser	Gly	Ala	Ala	Tyr	Val	Pro	Ile	Asp	Ala	Asp	Leu	Pro														
									595						605														
Ala	Glu	Arg	Ile	His	Tyr	Leu	Leu	Asp	His	Gly	Glu	Val	Lys	Leu	Val														
									610						620														
Leu	Thr	Gln	Pro	Trp	Leu	Asp	Gly	Lys	Leu	Ser	Trp	Pro	Pro	Gly	Ile														
									625						640														
Gln	Arg	Leu	Leu	Val	Ser	Glu	Ala	Gly	Val	Glu	Gly	Asp	Gly	Asp	Gln														
									630						655														
Pro	Pro	Met	Met	Pro	Ile	Gln	Thr	Pro	Ser	Asp	Leu	Ala	Tyr	Val	Ile														
									660						670														
Tyr	Thr	Ser	Gly	Ser	Thr	Gly	Leu	Pro	Lys	Gly	Val	Met	Ile	Asp	His														
									675						685														
Arg	Gly	Ala	Val	Asn	Thr	Ile	Leu	Asp	Ile	Asn	Glu	Arg	Phe	Glu	Ile														

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690

695

700

Gly 705	Pro	Gly 705	Asp 705	Arg 705	Val 710	Leu 710	Ala 710	Leu 715	Ser 715	Ser 715	Leu 715	Ser 715	Phe 720	Asp 720	Leu 720
Ser 725	Val 725	Tyr 725	Asp 725	Val 725	Phe 725	Gly 730	Ile 730	Leu 730	Ala 730	Ala 730	Gly 735	Gly 735	Thr 735	Ile 735	Val 735
Val 740	Pro 740	Asp 740	Ala 740	Ser 740	Lys 745	Leu 745	Arg 745	Asp 745	Pro 745	Ala 750	His 750	Trp 750	Ala 750	Glu 750	Leu 750
Ile 755	Glu 755	Arg 755	Glu 755	Lys 755	Val 760	Thr 760	Val 760	Trp 760	Asn 760	Ser 760	Val 765	Pro 765	Ala 765	Leu 765	Met 765
Arg 770	Met 770	Leu 770	Val 770	Glu 770	His 775	Phe 775	Glu 775	Gly 775	Arg 775	Pro 780	Asp 780	Ser 780	Leu 780	Ala 780	Arg 780
Ser 785	Leu 785	Arg 785	Leu 785	Ser 785	Leu 790	Leu 790	Ser 790	Gly 795	Asp 795	Trp 795	Ile 795	Pro 795	Val 795	Gly 800	Leu 800
Pro 805	Gly 805	Glu 805	Leu 805	Gln 805	Ala 805	Ile 810	Arg 810	Pro 810	Gly 810	Val 810	Ser 810	Val 810	Ile 815	Ser 815	Leu 815
Gly 820	Gly 820	Ala 820	Thr 820	Glu 820	Ala 820	Ser 825	Ile 825	Trp 825	Ser 825	Ile 825	Gly 830	Tyr 830	Pro 830	Val 830	Arg 830
Asn 835	Val 835	Asp 835	Leu 835	Ser 835	Trp 840	Ala 840	Ser 840	Ile 840	Pro 840	Tyr 845	Gly 845	Arg 845	Pro 845	Leu 845	Arg 845
Asn 850	Gln 850	Thr 850	Phe 850	His 850	Val 855	Leu 855	Asp 855	Glu 855	Ala 855	Leu 860	Glu 860	Pro 860	Arg 860	Pro 860	Val 860
Trp 865	Val 865	Pro 865	Gly 865	Gln 865	Leu 870	Tyr 870	Ile 870	Gly 875	Gly 875	Val 875	Gly 875	Leu 875	Ala 875	Leu 875	Gly 875
Tyr 885	Trp 885	Arg 885	Asp 885	Glu 885	Glu 885	Lys 885	Thr 885	Arg 890	Lys 890	Ser 890	Phe 895	Leu 895	Val 895	His 895	Pro 895
Glu 900	Thr 900	Gly 900	Glu 900	Arg 900	Leu 900	Tyr 905	Lys 905	Thr 905	Gly 905	Asp 905	Leu 910	Gly 910	Arg 910	Tyr 910	Leu 910
Pro 915	Asp 915	Gly 915	Asn 915	Ile 915	Glu 920	Phe 920	Met 920	Gly 920	Arg 920	Glu 925	Asp 925	Asn 925	Gln 925	Ile 925	Lys 925
Leu 930	Arg 930	Gly 930	Tyr 930	Arg 930	Val 935	Glu 935	Leu 935	Gly 935	Glu 935	Ile 940	Glu 940	Glu 940	Thr 940	Leu 940	Lys 940
Ser 945	His 945	Pro 945	Asn 945	Val 945	Arg 950	Asp 950	Ala 950	Val 950	Ile 955	Val 955	Pro 955	Val 955	Gly 960	Asn 960	Asp 960
Ala 965	Ala 965	Asn 965	Lys 965	Leu 965	Leu 965	Leu 965	Ala 965	Tyr 965	Val 970	Val 970	Pro 970	Glu 975	Gly 975	Thr 975	Arg 975
Arg 980	Arg 980	Ala 980	Ala 980	Glu 980	Gln 980	Asp 985	Ala 985	Ser 985	Leu 985	Lys 985	Thr 990	Glu 990	Arg 990	Ile 990	Asp 990
Ala 995	Arg 995	Ala 995	His 995	Ala 995	Ala 995	Glu 995	Ala 995	Asp 995	Gly 995	Leu 995	Ser 995	Asp 995	Gly 995	Glu 995	Arg 995
Val 1010	Gln 1010	Phe 1010	Lys 1010	Leu 1010	Ala 1010	Arg 1015	His 1015	Gly 1015	Leu 1015	Arg 1015	Asp 1020	Leu 1020	Arg 1020	Leu 1020	Gly 1020
Lys 1025	Pro 1025	Val 1025	Val 1025	Asp 1025	Leu 1025	Thr 1025	Gly 1025	Gln 1025	Asp 1025	Pro 1025	Arg 1025	Glu 1025	Ala 1025	Gly 1025	Leu 1025
Asp 1030	Val 1030	Tyr 1030	Ala 1030	Arg 1030	Arg 1030	Arg 1030	Ser 1030	Val 1030	Arg 1030	Thr 1030	Phe 1030	Leu 1030	Glu 1030	Ala 1030	Pro 1030

1045

1050

1055

Ile Pro Phe Val Glu Phe Gly Arg Phe Leu Ser Cys Leu Ser Ser Val
 1060 1065 1070

Glu Pro Asp Gly Ala Thr Leu Pro Lys Phe Arg Tyr Pro Ser Ala Gly
 1075 1080 1085

Ser Thr Tyr Pro Val Gln Thr Tyr Ala Tyr Val Lys Ser Gly Arg Ile
 1090 1095 1100

Glu Gly Val Asp Glu Gly Phe Tyr Tyr Tyr His Pro Phe Glu His Arg
 1105 1110 1115 1120

Leu Leu Lys Leu Ser Asp His Gly Ile Glu Arg Gly Ala His Val Arg
 1125 1130 1135

Gln Asn Phe Asp Val Phe Asp Glu Ala Ala Phe Asn Leu Leu Phe Val
 1140 1145 1150

Gly Arg Ile Asp Ala Ile Glu Ser Leu Tyr Gly Ser Ser Ser Arg Glu
 1155 1160 1165

Phe Cys Leu Leu Glu Ala Gly Tyr Met Ala Gln Leu Leu Met Glu Gln
 1170 1175 1180

Ala Pro Ser Cys Asn Ile Gly Val Cys Pro Val Gly Gln Phe Asn Phe
 1185 1190 1195 1200

Glu Gln Val Arg Pro Val Leu Asp Leu Arg His Ser Asp Val Tyr Val
 1205 1210 1215

His Gly Met Leu Gly Gly Arg Val Asp Pro Arg Gln Phe Gln Val Cys
 1220 1225 1230

Thr Leu Gly Gln Asp Ser Ser Pro Arg Arg Ala Thr Thr Arg Gly Ala
 1235 1240 1245

Pro Pro Gly Arg Glu Gln His Phe Ala Asp Met Leu Arg Asp Phe Leu
 1250 1255 1260

Arg Thr Lys Leu Pro Glu Tyr Met Val Pro Thr Val Phe Val Glu Leu
 1265 1270 1275 1280

Asp Ala Leu Pro Leu Thr Ser Asn Gly Lys Val Asp Arg Lys Ala Leu
 1285 1290 1295

Arg Glu Arg Lys Asp Thr Ser Ser Pro Arg His Ser Gly His Thr Ala
 1300 1305 1310

Pro Arg Asp Ala Leu Glu Glu Ile Leu Val Ala Val Val Arg Glu Val
 1315 1320 1325

Leu Gly Leu Glu Val Val Gly Leu Gln Gln Ser Phe Val Asp Leu Gly
 1330 1335 1340

Ala Thr Ser Ile His Ile Val Arg Met Arg Ser Leu Leu Gln Lys Arg
 1345 1350 1355 1360

Leu Asp Arg Glu Ile Ala Ile Thr Glu Leu Phe Gln Tyr Pro Asn Leu
 1365 1370 1375

Gly Ser Leu Ala Ser Gly Leu Arg Arg Asp Ser Arg Asp Leu Asp Gln
 1380 1385 1390

Arg Pro Asn Met Gln Asp Arg Val Glu Val Arg Arg Lys Gly Arg Arg

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1395

1400

1405

Arg Ser
1410

<210> 4
 <211> 1832
 <212> PRT
 <213> Sorangium cellulosum

<400> 4

Met Glu Glu Gln Glu Ser Ser Ala Ile Ala Val Ile Gly Met Ser Gly
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Arg Phe Pro Gly Ala Arg Asp Leu Asp Glu Phe Trp Arg Asn Leu Arg
 20 25 30

Asp Gly Thr Glu Ala Val Gln Arg Phe Ser Glu Gln Glu Leu Ala Ala
 35 40 45

Ser Gly Val Asp Pro Ala Leu Val Leu Asp Pro Ser Tyr Val Arg Ala
 50 55 60

Gly Ser Val Leu Glu Asp Val Asp Arg Phe Asp Ala Ala Phe Phe Gly
 65 70 75 80

Ile Ser Pro Arg Glu Ala Glu Leu Met Asp Pro Gln His Arg Ile Phe
 85 90 95

Met Glu Cys Ala Trp Glu Ala Leu Glu Asn Ala Gly Tyr Asp Pro Thr
 100 105 110

Ala Tyr Glu Gly Ser Ile Gly Val Tyr Ala Gly Ala Asn Met Ser Ser
 115 120 125

Tyr Leu Thr Ser Asn Leu His Glu His Pro Ala Met Met Arg Trp Pro
 130 135 140

Gly Trp Phe Gln Thr Leu Ile Gly Asn Asp Lys Asp Tyr Leu Ala Thr
 145 150 155 160

His Val Ser Tyr Arg Leu Asn Leu Arg Gly Pro Ser Ile Ser Val Gln
 165 170 175

Thr Ala Cys Ser Thr Ser Leu Val Ala Val His Leu Ala Cys Met Ser
 180 185 190

Leu Leu Asp Arg Glu Cys Asp Met Ala Leu Ala Gly Gly Ile Thr Val
 195 200 205

Arg Ile Pro His Arg Ala Gly Tyr Val Tyr Ala Glu Gly Gly Ile Phe
 210 215 220

Ser Pro Asp Gly His Cys Arg Ala Phe Asp Ala Lys Ala Asn Gly Thr
 225 230 235 240

Ile Met Gly Asn Gly Cys Gly Val Val Leu Leu Lys Pro Leu Asp Arg
 245 250 255

Ala Leu Ser Asp Gly Asp Pro Val Arg Ala Val Ile Leu Gly Ser Ala
 260 265 270

Thr Asn Asn Asp Gly Ala Arg Lys Ile Gly Phe Thr Ala Pro Ser Glu
 275 280 285

Val Gly Gln Ala Gln Ala Ile Met Glu Ala Leu Ala Leu Ala Gly Val
 290 295 300
 Glu Ala Arg Ser Ile Gln Tyr Ile Glu Thr His Gly Thr Gly Thr Leu
 305 310 315 320
 Leu Gly Asp Ala Ile Glu Thr Ala Ala Leu Arg Arg Val Phe Gly Arg
 325 330 335
 Asp Ala Ser Ala Arg Arg Ser Cys Ala Ile Gly Ser Val Lys Thr Gly
 340 345 350
 Ile Gly His Leu Glu Ser Ala Ala Gly Ile Ala Gly Leu Ile Lys Thr
 355 360 365
 Val Leu Ala Leu Glu His Arg Gln Leu Pro Pro Ser Leu Asn Phe Glu
 370 375 380
 Ser Pro Asn Pro Ser Ile Asp Phe Ala Ser Ser Pro Phe Tyr Val Asn
 385 390 395 400
 Thr Ser Leu Lys Asp Trp Asn Thr Gly Ser Thr Pro Arg Arg Ala Gly
 405 410 415
 Val Ser Ser Phe Gly Ile Gly Gly Thr Asn Ala His Val Val Leu Glu
 420 425 430
 Glu Ala Pro Ala Ala Lys Leu Pro Ala Ala Ala Pro Ala Arg Ser Ala
 435 440 445
 Glu Leu Phe Val Val Ser Ala Lys Ser Ala Ala Leu Asp Ala Ala
 450 455 460
 Ala Ala Arg Leu Arg Asp His Leu Gln Ala His Gln Gly Ile Ser Leu
 465 470 475 480
 Gly Asp Val Ala Phe Ser Leu Ala Thr Thr Arg Ser Pro Met Glu His
 485 490 495
 Arg Leu Ala Met Ala Ala Pro Ser Arg Glu Ala Leu Arg Glu Gly Leu
 500 505 510
 Asp Ala Ala Ala Arg Gly Gln Thr Pro Pro Gly Ala Val Arg Gly Arg
 515 520 525
 Cys Ser Pro Gly Asn Val Pro Lys Val Val Phe Val Phe Pro Gly Gln .
 530 535 540
 Gly Ser Gln Trp Val Gly Met Gly Arg Gln Leu Leu Ala Glu Glu Pro
 545 550 555 560
 Val Phe His Ala Ala Leu Ser Ala Cys Asp Arg Ala Ile Gln Ala Glu
 565 570 575
 Ala Gly Trp Ser Leu Leu Ala Glu Leu Ala Ala Asp Glu Gly Ser Ser
 580 585 590
 Gln Leu Glu Arg Ile Asp Val Val Gln Pro Val Leu Phe Ala Leu Ala
 595 600 605
 Val Ala Phe Ala Ala Leu Trp Arg Ser Trp Gly Val Ala Pro Asp Val
 610 615 620
 Val Ile Gly His Ser Met Gly Glu Val Ala Ala His Val Ala Gly
 625 630 635 640

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Ala Leu Ser Leu Glu Asp Ala Val Ala Ile Ile Cys Arg Arg Ser Arg
 645 650 655
 Leu Leu Arg Arg Ile Ser Gly Gln Gly Glu Met Ala Val Thr Glu Leu
 660 665 670
 Ser Leu Ala Glu Ala Glu Ala Ala Leu Arg Gly Tyr Glu Asp Arg Val
 675 680 685
 Ser Val Ala Val Ser Asn Ser Pro Arg Ser Thr Val Leu Ser Gly Glu
 690 695 700
 Pro Ala Ala Ile Gly Glu Val Leu Ser Ser Leu Asn Ala Lys Gly Val
 705 710 715 720
 Phe Cys Arg Arg Val Lys Val Asp Val Ala Ser His Ser Pro Gln Val
 725 730 735
 Asp Pro Leu Arg Glu Asp Leu Leu Ala Ala Leu Gly Gly Leu Arg Pro
 740 745 750
 Gly Ala Ala Val Pro Met Arg Ser Thr Val Thr Gly Ala Met Val
 755 760 765
 Ala Gly Pro Glu Leu Gly Ala Asn Tyr Trp Met Asn Asn Leu Arg Gln
 770 775 780
 Pro Val Arg Phe Ala Glu Val Val Gln Ala Gln Leu Gln Gly Gly His
 785 790 795 800
 Gly Leu Phe Val Glu Met Ser Pro His Pro Ile Leu Thr Thr Ser Val
 805 810 815
 Glu Glu Met Arg Arg Ala Ala Gln Arg Ala Gly Ala Ala Val Gly Ser
 820 825 830
 Leu Arg Arg Gly Gln Asp Glu Arg Pro Ala Met Leu Glu Ala Leu Gly
 835 840 845
 Thr Leu Trp Ala Gln Gly Tyr Pro Val Pro Trp Gly Arg Leu Phe Pro
 850 855 860
 Ala Gly Gly Arg Arg Val Pro Leu Pro Thr Tyr Pro Trp Gln Arg Glu
 865 870 875 880
 Arg Tyr Trp Ile Glu Ala Pro Ala Lys Ser Ala Ala Gly Asp Arg Arg
 885 890 895
 Gly Val Arg Ala Gly Gly His Pro Leu Leu Gly Glu Met Gln Thr Leu
 900 905 910
 Ser Thr Gln Thr Ser Thr Arg Leu Trp Glu Thr Thr Leu Asp Leu Lys
 915 920 925
 Arg Leu Pro Trp Leu Gly Asp His Arg Val Gln Gly Ala Val Val Phe
 930 935 940
 Pro Gly Ala Ala Tyr Leu Glu Met Ala Ile Ser Ser Gly Ala Glu Ala
 945 950 955 960
 Leu Gly Asp Gly Pro Leu Gln Ile Thr Asp Val Val Leu Ala Glu Ala
 965 970 975
 Leu Ala Phe Ala Gly Asp Ala Ala Val Leu Val Gln Val Val Thr Thr
 980 985 990

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Glu Gln Pro Ser Gly Arg Leu Gln Phe Gln Ile Ala Ser Arg Ala Pro
 995 1000 1005
 Gly Ala Gly His Ala Ser Phe Arg Val His Ala Arg Gly Ala Leu Leu
 1010 1015 1020
 Arg Val Glu Arg Thr Glu Val Pro Ala Gly Leu Thr Leu Ser Ala Val
 1025 1030 1035 1040
 Arg Ala Arg Leu Gln Ala Ser Ile Pro Ala Ala Thr Tyr Ala Glu
 1045 1050 1055
 Leu Thr Glu Met Gly Leu Gln Tyr Gly Pro Ala Phe Gln Gly Ile Ala
 1060 1065 1070
 Glu Leu Trp Arg Gly Glu Gly Glu Ala Leu Gly Arg Val Arg Leu Pro
 1075 1080 1085
 Asp Ala Ala Gly Ser Ala Ala Glu Tyr Arg Leu His Pro Ala Leu Leu
 1090 1095 1100
 Asp Ala Cys Phe Gln Ile Val Gly Ser Leu Phe Ala Arg Ser Gly Glu
 1105 1110 1115 1120
 Ala Thr Pro Trp Val Pro Val Glu Leu Gly Ser Leu Arg Leu Leu Gln
 1125 1130 1135
 Arg Pro Ser Gly Glu Leu Trp Cys His Ala Arg Val Val Asn His Gly
 1140 1145 1150
 His Gln Thr Pro Asp Arg Gln Gly Ala Asp Phe Trp Val Val Asp Ser
 1155 1160 1165
 Ser Gly Ala Val Val Ala Glu Val Cys Gly Leu Val Ala Gln Arg Leu
 1170 1175 1180
 Pro Gly Gly Val Arg Arg Glu Glu Asp Asp Trp Phe Leu Glu Leu
 1185 1190 1195 1200
 Glu Trp Glu Pro Ala Ala Val Gly Thr Ala Lys Val Asn Ala Gly Arg
 1205 1210 1215
 Trp Leu Leu Leu Gly Gly Gly Gly Gly Leu Gly Ala Ala Leu Arg Ala
 1220 1225 1230
 Met Leu Glu Ala Gly Gly His Ala Val Val His Ala Ala Glu Asn Asn .
 1235 1240 1245
 Thr Ser Ala Ala Gly Val Arg Ala Leu Leu Ala Lys Ala Phe Asp Gly
 1250 1255 1260
 Gln Ala Pro Thr Ala Val Val His Leu Gly Ser Leu Asp Gly Gly Gly
 1265 1270 1275 1280
 Glu Leu Asp Pro Gly Leu Gly Ala Gln Gly Ala Leu Asp Ala Pro Arg
 1285 1290 1295
 Ser Ala Asp Val Ser Pro Asp Ala Leu Asp Pro Ala Leu Val Arg Gly
 1300 1305 1310
 Cys Asp Ser Val Leu Trp Thr Val Gln Ala Leu Ala Gly Met Gly Phe
 1315 1320 1325
 Arg Asp Ala Pro Arg Leu Trp Leu Leu Thr Arg Gly Ala Gln Ala Val
 1330 1335 1340

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Gly Ala Gly Asp Val Ser Val Thr Gln Ala Pro Leu Leu Gly Leu Gly
1345 1350 1355 1360

Arg Val Ile Ala Met Glu His Ala Asp Leu Arg Cys Ala Arg Val Asp
1365 1370 1375

Leu Asp Pro Ala Arg Pro Glu Gly Glu Leu Ala Ala Leu Leu Ala Glu
1380 1385 1390

Leu Leu Ala Asp Asp Ala Glu Ala Glu Val Ala Leu Arg Gly Gly Glu
1395 1400 1405

Arg Cys Val Ala Arg Ile Val Arg Arg Gln Pro Glu Thr Arg Pro Arg
1410 1415 1420

Gly Arg Ile Glu Ser Cys Val Pro Thr Asp Val Thr Ile Arg Ala Asp
1425 1430 1435 1440

Ser Thr Tyr Leu Val Thr Gly Gly Leu Gly Gly Leu Gly Leu Ser Val
1445 1450 1455

Ala Gly Trp Leu Ala Glu Arg Gly Ala Gly His Leu Val Leu Val Gly
1460 1465 1470

Arg Ser Gly Ala Ala Ser Val Glu Gln Arg Ala Ala Val Ala Ala Leu
1475 1480 1485

Glu Ala Arg Gly Ala Arg Val Thr Val Ala Lys Ala Asp Val Ala Asp
1490 1495 1500

Arg Ala Gln Leu Glu Arg Ile Leu Arg Glu Val Thr Thr Ser Gly Met
1505 1510 1515 1520

Pro Leu Arg Gly Val Val His Ala Ala Gly Ile Leu Asp Asp Gly Leu
1525 1530 1535

Leu Met Gln Gln Thr Pro Ala Arg Phe Arg Lys Val Met Ala Pro Lys
1540 1545 1550

Val Gln Gly Ala Leu His Leu His Ala Leu Thr Arg Glu Ala Pro Leu
1555 1560 1565

Ser Phe Phe Val Leu Tyr Ala Ser Gly Val Gly Leu Leu Gly Ser Pro
1570 1575 1580

Gly Gln Gly Asn Tyr Ala Ala Ala Asn Thr Phe Leu Asp Ala Leu Ala
1585 1590 1595 1600

His His Arg Arg Ala Gln Gly Leu Pro Ala Leu Ser Val Asp Trp Gly
1605 1610 1615

Leu Phe Ala Glu Val Gly Met Ala Ala Ala Gln Glu Asp Arg Gly Ala
1620 1625 1630

Arg Leu Val Ser Arg Gly Met Arg Ser Leu Thr Pro Asp Glu Gly Leu
1635 1640 1645

Ser Ala Leu Ala Arg Leu Leu Glu Ser Gly Arg Ala Gln Val Gly Val
1650 1655 1660

Met Pro Val Asn Pro Arg Leu Trp Val Glu Leu Tyr Pro Ala Ala Ala
1665 1670 1675 1680

Ser Ser Arg Met Leu Ser Arg Leu Val Thr Ala His Arg Ala Ser Ala
1685 1690 1695

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Gly Gly Pro Ala Gly Asp Gly Asp Leu Leu Arg Arg Leu Ala Ala Ala
1700 1705 1710

Glu Pro Ser Ala Arg Ser Ala Leu Leu Glu Pro Leu Leu Arg Ala Gln
1715 1720 1725

Ile Ser Gln Val Leu Arg Leu Pro Glu Gly Lys Ile Glu Val Asp Ala
1730 1735 1740

Pro Leu Thr Ser Leu Gly Met Asn Ser Leu Met Gly Leu Glu Leu Arg
1745 1750 1755 1760

Asn Arg Ile Glu Ala Met Leu Gly Ile Thr Val Pro Ala Thr Leu Leu
1765 1770 1775

Trp Thr Tyr Pro Thr Val Ala Ala Leu Ser Gly His Leu Ala Arg Glu
1780 1785 1790

Ala Cys Glu Ala Ala Pro Val Glu Ser Pro His Thr Thr Ala Asp Ser
1795 1800 1805

Ala Val Glu Ile Glu Glu Met Ser Gln Asp Asp Leu Thr Gln Leu Ile
1810 1815 1820

Ala Ala Lys Phe Lys Ala Leu Thr
1825 1830

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<211> 7257

<212> PRT

<213> Sorangium cellulosum

<400> 5

Met Thr Thr Arg Gly Pro Thr Ala Gln Gln Asn Pro Leu Lys Gln Ala
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Ala Ile Ile Ile Gln Arg Leu Glu Glu Arg Leu Ala Gly Leu Ala Gln
20 25 30

Ala Glu Leu Glu Arg Thr Glu Pro Ile Ala Ile Val Gly Ile Gly Cys
35 40 45

Arg Phe Pro Gly Gly Ala Asp Ala Pro Glu Ala Phe Trp Glu Leu Leu
50 55 60

Asp Ala Glu Arg Asp Ala Val Gln Pro Leu Asp Met Arg Trp Ala Leu
65 70 75 80

Val Gly Val Ala Pro Val Glu Ala Val Pro His Trp Ala Gly Leu Leu
85 90 95

Thr Glu Pro Ile Asp Cys Phe Asp Ala Ala Phe Phe Gly Ile Ser Pro
100 105 110

Arg Glu Ala Arg Ser Leu Asp Pro Gln His Arg Leu Leu Leu Glu Val
115 120 125

Ala Trp Glu Gly Leu Glu Asp Ala Gly Ile Pro Pro Arg Ser Ile Asp
130 135 140

Gly Ser Arg Thr Gly Val Phe Val Gly Ala Phe Thr Ala Asp Tyr Ala
145 150 155 160

Arg Thr Val Ala Arg Leu Pro Arg Glu Glu Arg Asp Ala Tyr Ser Ala
165 170 175

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Thr Gly Asn Met Leu Ser Ile Ala Ala Gly Arg Leu Ser Tyr Thr Leu
 180 185 190
 Gly Leu Gln Gly Pro Cys Leu Thr Val Asp Thr Ala Cys Ser Ser Ser
 195 200 205
 Leu Val Ala Ile His Leu Ala Cys Arg Ser Leu Arg Ala Gly Glu Ser
 210 215 220
 Asp Leu Ala Leu Ala Gly Gly Val Ser Ala Leu Leu Ser Pro Asp Met
 225 230 235 240
 Met Glu Ala Ala Ala Arg Thr Gln Ala Leu Ser Pro Asp Gly Arg Cys
 245 250 255
 Arg Thr Phe Asp Ala Ser Ala Asn Gly Phe Val Arg Gly Glu Gly Cys
 260 265 270
 Gly Leu Val Val Leu Lys Arg Leu Ser Asp Ala Gln Arg Asp Gly Asp
 275 280 285
 Arg Ile Trp Ala Leu Ile Arg Gly Ser Ala Ile Asn His Asp Gly Arg
 290 295 300
 Ser Thr Gly Leu Thr Ala Pro Asn Val Leu Ala Gln Glu Thr Val Leu
 305 310 315 320
 Arg Glu Ala Leu Arg Ser Ala His Val Glu Ala Gly Ala Val Asp Tyr
 325 330 335
 Val Glu Thr His Gly Thr Gly Thr Ser Leu Gly Asp Pro Ile Glu Val
 340 345 350
 Glu Ala Leu Arg Ala Thr Val Gly Pro Ala Arg Ser Asp Gly Thr Arg
 355 360 365
 Cys Val Leu Gly Ala Val Lys Thr Asn Ile Gly His Leu Glu Ala Ala
 370 375 380
 Ala Gly Val Ala Gly Leu Ile Lys Ala Ala Leu Ser Leu Thr His Glu
 385 390 395 400
 Arg Ile Pro Arg Asn Leu Asn Phe Arg Thr Leu Asn Pro Arg Ile Arg
 405 410 415
 Leu Glu Gly Ser Ala Leu Ala Leu Ala Thr Glu Pro Val Pro Trp Pro
 420 425 430
 Arg Thr Asp Arg Pro Arg Phe Ala Gly Val Ser Ser Phe Gly Met Ser
 435 440 445
 Gly Thr Asn Ala His Val Val Leu Glu Glu Ala Pro Ala Val Glu Leu
 450 455 460
 Trp Pro Ala Ala Pro Glu Arg Ser Ala Glu Leu Val Leu Ser Gly
 465 470 475 480
 Lys Ser Glu Gly Ala Leu Asp Ala Gln Ala Ala Arg Leu Arg Glu His
 485 490 495
 Leu Asp Met His Pro Glu Leu Gly Leu Gly Asp Val Ala Phe Ser Leu
 500 505 510
 Ala Thr Thr Arg Ser Ala Met Ser His Arg Leu Ala Val Ala Val Thr
 515 520 525

Ser Arg Glu Gly Leu Leu Ala Ala Leu Ser Ala Val Ala Gln Gly Gln
 530 535 540
 Thr Pro Ala Gly Ala Ala Arg Cys Ile Ala Ser Ser Ser Arg Gly Lys
 545 550 555
 Leu Ala Phe Leu Phe Thr Gly Gln Gly Ala Gln Thr Pro Gly Met Gly
 565 570 575
 Arg Gly Leu Cys Ala Ala Trp Pro Ala Phe Arg Glu Ala Phe Asp Arg
 580 585 590
 Cys Val Ala Leu Phe Asp Arg Glu Leu Asp Arg Pro Leu Arg Glu Val
 595 600 605
 Met Trp Ala Glu Ala Gly Ser Ala Glu Ser Leu Leu Leu Asp Gln Thr
 610 615 620
 Ala Phe Thr Gln Pro Ala Leu Phe Ala Val Glu Tyr Ala Leu Thr Ala
 625 630 635
 Leu Trp Arg Ser Trp Gly Val Glu Pro Glu Leu Leu Val Gly His Ser
 645 650 655
 Ile Gly Glu Leu Val Ala Ala Cys Val Ala Gly Val Phe Ser Leu Glu
 660 665 670
 Asp Gly Val Arg Leu Val Ala Ala Arg Gly Arg Leu Met Gln Gly Leu
 675 680 685
 Ser Ala Gly Gly Ala Met Val Ser Leu Gly Ala Pro Glu Ala Glu Val
 690 695 700
 Ala Ala Ala Val Ala Pro His Ala Ala Ser Val Ser Ile Ala Ala Val
 705 710 715 720
 Asn Gly Pro Glu Gln Val Val Ile Ala Gly Val Glu Gln Ala Val Gln
 725 730 735
 Ala Ile Ala Ala Gly Phe Ala Ala Arg Gly Ala Arg Thr Lys Arg Leu
 740 745 750
 His Val Ser His Ala Phe His Ser Pro Leu Met Glu Pro Met Leu Glu
 755 760 765
 Glu Phe Gly Arg Val Ala Ala Ser Val Thr Tyr Arg Pro Ser Val
 770 775 780
 Ser Leu Val Ser Asn Leu Ser Gly Lys Val Val Thr Asp Glu Leu Ser
 785 790 795 800
 Ala Pro Gly Tyr Trp Val Arg His Val Arg Glu Ala Val Arg Phe Ala
 805 810 815
 Asp Gly Val Lys Ala Leu His Glu Ala Gly Ala Gly Thr Phe Val Glu
 820 825 830
 Val Gly Pro Lys Pro Thr Leu Leu Gly Leu Leu Pro Ala Cys Leu Pro
 835 840 845
 Glu Ala Glu Pro Thr Leu Leu Ala Ser Leu Arg Ala Gly Arg Glu Glu
 850 855 860
 Ala Ala Gly Val Leu Glu Ala Leu Gly Arg Leu Trp Ala Ala Gly Gly
 865 870 875 880

Ser Val Ser Trp Pro Gly Val Phe Pro Thr Ala Gly Arg Arg Val Pro
 885 890
 Leu Pro Thr Tyr Pro Trp Gln Arg Gln Arg Tyr Trp Ile Glu Ala Pro
 900 905 910
 Ala Glu Gly Leu Gly Ala Thr Ala Ala Asp Ala Leu Ala Gln Trp Phe
 915 920 925
 Tyr Arg Val Asp Trp Pro Glu Met Pro Arg Ser Ser Val Asp Ser Arg
 930 935 940
 Arg Ala Arg Ser Gly Gly Trp Leu Val Leu Ala Asp Arg Gly Gly Val
 945 950 955 960
 Gly Glu Ala Ala Ala Ala Ala Leu Ser Ser Gln Gly Cys Ser Cys Ala
 965 970 975
 Val Leu His Ala Pro Ala Glu Ala Ser Ala Val Ala Glu Gln Val Thr
 980 985 990
 Gln Ala Leu Gly Gly Arg Asn Asp Trp Gln Gly Val Leu Tyr Leu Trp
 995 1000 1005
 Gly Leu Asp Ala Val Val Glu Ala Gly Ala Ser Ala Glu Glu Val Ala
 1010 1015 1020
 Lys Val Thr His Leu Ala Ala Ala Pro Val Leu Ala Leu Ile Gln Ala
 1025 1030 1035 1040
 Leu Gly Thr Gly Pro Arg Ser Pro Arg Leu Trp Ile Val Thr Arg Gly
 1045 1050 1055
 Ala Cys Thr Val Gly Gly Glu Pro Asp Ala Ala Pro Cys Gln Ala Ala
 1060 1065 1070
 Leu Trp Gly Met Gly Arg Val Ala Ala Leu Glu His Pro Gly Ser Trp
 1075 1080 1085
 Gly Gly Leu Val Asp Leu Asp Pro Glu Glu Ser Pro Thr Glu Val Glu
 1090 1095 1100
 Ala Leu Val Ala Glu Leu Leu Ser Pro Asp Ala Glu Asp Gln Leu Ala
 1105 1110 1115 1120
 Phe Arg Gln Gly Arg Arg Ala Ala Arg Leu Val Ala Ala Pro Pro
 1125 1130 1135
 Glu Gly Asn Ala Ala Pro Val Ser Leu Ser Ala Glu Gly Ser Tyr Leu
 1140 1145 1150
 Val Thr Gly Gly Leu Gly Ala Leu Gly Leu Leu Val Ala Arg Trp Leu
 1155 1160 1165
 Val Glu Arg Gly Ala Gly His Leu Val Leu Ile Ser Arg His Gly Leu
 1170 1175 1180
 Pro Asp Arg Glu Glu Trp Gly Arg Asp Gln Pro Pro Glu Val Arg Ala
 1185 1190 1195 1200
 Arg Ile Ala Ala Ile Glu Ala Leu Glu Ala Gln Gly Ala Arg Val Thr
 1205 1210 1215
 Val Ala Ala Val Asp Val Ala Asp Ala Glu Gly Met Ala Ala Leu Leu
 1220 1225 1230

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Ala Ala Val Glu .Pro Pro Leu Arg Gly Val Val His Ala Ala Gly Leu
 1235 1240 1245
 Leu Asp Asp Gly Leu Leu Ala His Gln Asp Ala Gly Arg Leu Ala Arg
 1250 1255 1260
 Val Leu Arg Pro Lys Val Glu Gly Ala Trp Val Leu His Thr Leu Thr
 1265 1270 1275 1280
 Arg Glu Gln Pro Leu Asp Leu Phe Val Leu Phe Ser Ser Ala Ser Gly
 1285 1290 1295
 Val Phe Gly Ser Ile Gly Gln Gly Ser Tyr Ala Ala Gly Asn Ala Phe
 1300 1305 1310
 Leu Asp Ala Leu Ala Asp Leu Arg Arg Thr Gln Gly Leu Ala Ala Leu
 1315 1320 1325
 Ser Ile Ala Trp Gly Leu Trp Ala Glu Gly Gly Met Gly Ser Gln Ala
 1330 1335 1340
 Gln Arg Arg Glu His Glu Ala Ser Gly Ile Trp Ala Met Pro Thr Ser
 1345 1350 1355 1360
 Arg Ala Leu Ala Ala Met Glu Trp Leu Leu Gly Thr Arg Ala Thr Gln
 1365 1370 1375
 Arg Val Val Ile Gln Met Asp Trp Ala His Ala Gly Ala Ala Pro Arg
 1380 1385 1390
 Asp Ala Ser Arg Gly Arg Phe Trp Asp Arg Leu Val Thr Ala Thr Lys
 1395 1400 1405
 Glu Ala Ser Ser Ser Ala Val Pro Ala Val Glu Arg Trp Arg Asn Ala
 1410 1415 1420
 Ser Val Val Glu Thr Arg Ser Ala Leu Tyr Glu Leu Val Arg Gly Val
 1425 1430 1435 1440
 Val Ala Gly Val Met Gly Phe Thr Asp Gln Gly Thr Leu Asp Val Arg
 1445 1450 1455
 Arg Gly Phe Ala Glu Gln Gly Leu Asp Ser Leu Met Ala Val Glu Ile
 1460 1465 1470
 Arg Lys Arg Leu Gln Gly Glu Leu Gly Met Pro Leu Ser Ala Thr Leu
 1475 1480 1485
 Ala Phe Asp His Pro Thr Val Glu Arg Leu Val Glu Tyr Leu Leu Ser
 1490 1495 1500
 Gln Ala Leu Glu Leu Gln Asp Arg Thr Asp Val Arg Ser Val Arg Leu
 1505 1510 1515 1520
 Pro Ala Thr Glu Asp Pro Ile Ala Ile Val Gly Ala Ala Cys Arg Phe
 1525 1530 1535
 Pro Gly Gly Val Glu Asp Leu Glu Ser Tyr Trp Gln Leu Leu Thr Glu
 1540 1545 1550
 Gly Val Val Val Ser Thr Glu Val Pro Ala Asp Arg Trp Asn Gly Ala
 1555 1560 1565
 Asp Gly Arg Val Pro Gly Ser Gly Glu Ala Gln Arg Gln Thr Tyr Val
 1570 1575 1580

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Pro Arg Gly Gly Phe Leu Arg Glu Val Glu Thr Phe Asp Ala Ala Phe
 1585 1590 1595 1600
 Phe His Ile Ser Pro Arg Glu Ala Met Ser Leu Asp Pro Gln Gln Arg
 1605 1610 1615
 Leu Leu Leu Glu Val Ser Trp Glu Ala Ile Glu Arg Ala Gly Gln Asp
 1620 1625 1630
 Pro Ser Ala Leu Arg Glu Ser Pro Thr Gly Val Phe Val Gly Ala Gly
 1635 1640 1645
 Pro Asn Glu Tyr Ala Glu Arg Val Gln Glu Leu Ala Asp Glu Ala Ala
 1650 1655 1660
 Gly Leu Tyr Ser Gly Thr Gly Asn Met Leu Ser Val Ala Ala Gly Arg
 1665 1670 1675 1680
 Leu Ser Phe Phe Leu Gly Leu His Gly Pro Thr Leu Ala Val Asp Thr
 1685 1690 1695
 Ala Cys Ser Ser Ser Leu Val Ala Leu His Leu Gly Cys Gln Ser Leu
 1700 1705 1710
 Arg Arg Gly Glu Cys Asp Gln Ala Leu Val Gly Gly Val Asn Met Leu
 1715 1720 1725
 Leu Ser Pro Lys Thr Phe Ala Leu Leu Ser Arg Met His Ala Leu Ser
 1730 1735 1740
 Pro Gly Gly Arg Cys Lys Thr Phe Ser Ala Asp Ala Asp Gly Tyr Ala
 1745 1750 1755 1760
 Arg Ala Glu Gly Cys Ala Val Val Val Leu Lys Arg Leu Ser Asp Ala
 1765 1770 1775
 Gln Arg Asp Arg Asp Pro Ile Leu Ala Val Ile Arg Gly Thr Ala Ile
 1780 1785 1790
 Asn His Asp Gly Pro Ser Ser Gly Leu Thr Val Pro Ser Gly Pro Ala
 1795 1800 1805
 Gln Glu Ala Leu Leu Arg Gln Ala Leu Ala His Ala Gly Val Val Pro
 1810 1815 1820
 Ala Asp Val Asp Phe Val Glu Cys His Gly Thr Gly Thr Ala Leu Gly
 1825 1830 1835 1840
 Asp Pro Ile Glu Val Arg Ala Leu Ser Asp Val Tyr Gly Gln Ala Arg
 1845 1850 1855
 Pro Ala Asp Arg Pro Leu Ile Leu Gly Ala Ala Lys Ala Asn Leu Gly
 1860 1865 1870
 His Met Glu Pro Ala Ala Gly Leu Ala Gly Leu Leu Lys Ala Val Leu
 1875 1880 1885
 Ala Leu Gly Gln Glu Gln Ile Pro Ala Gln Pro Glu Leu Gly Glu Leu
 1890 1895 1900
 Asn Pro Leu Leu Pro Trp Glu Ala Leu Pro Val Ala Val Ala Arg Ala
 1905 1910 1915 1920
 Ala Val Pro Trp Pro Arg Thr Asp Arg Pro Arg Phe Ala Gly Val Ser
 1925 1930 1935

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Ser Phe Gly Met Ser Gly Thr Asn Ala His Val Val Leu Glu Glu Ala
 1940 1945 1950
 Pro Ala Val Glu Leu Trp Pro Ala Ala Pro Glu Arg Ser Ala Glu Leu
 1955 1960 1965
 Leu Val Leu Ser Gly Lys Ser Glu Gly Ala Leu Asp Ala Gln Ala Ala
 1970 1975 1980
 Arg Leu Arg Glu His Leu Asp Met His Pro Glu Leu Gly Leu Gly Asp
 1985 1990 1995 2000
 Val Ala Phe Ser Leu Ala Thr Thr Arg Ser Ala Met Asn His Arg Leu
 2005 2010 2015
 Ala Val Ala Val Thr Ser Arg Glu Gly Leu Leu Ala Ala Leu Ser Ala
 2020 2025 2030
 Val Ala Gln Gly Gln Thr Pro Pro Gly Ala Ala Arg Cys Ile Ala Ser
 2035 2040 2045
 Ser Ser Arg Gly Lys Leu Ala Phe Leu Phe Thr Gly Gln Gly Ala Gln
 2050 2055 2060
 Thr Pro Gly Met Gly Arg Gly Leu Cys Ala Ala Trp Pro Ala Phe Arg
 2065 2070 2075 2080
 Glu Ala Phe Asp Arg Cys Val Ala Leu Phe Asp Arg Glu Leu Asp Arg
 2085 2090 2095
 Pro Leu Arg Glu Val Met Trp Ala Glu Pro Gly Ser Ala Glu Ser Leu
 2100 2105 2110
 Leu Leu Asp Gln Thr Ala Phe Thr Gln Pro Ala Leu Phe Thr Val Glu
 2115 2120 2125
 Tyr Ala Leu Thr Ala Leu Trp Arg Ser Trp Gly Val Glu Pro Glu Leu
 2130 2135 2140
 Val Ala Gly His Ser Ala Gly Glu Leu Val Ala Cys Val Ala Gly
 2145 2150 2155 2160
 Val Phe Ser Leu Glu Asp Gly Val Arg Leu Val Ala Ala Arg Gly Arg
 2165 2170 2175
 Leu Met Gln Gly Leu Ser Ala Gly Gly Ala Met Val Ser Leu Gly Ala
 2180 2185 2190
 Pro Glu Ala Glu Val Ala Ala Val Ala Pro His Ala Ala Ser Val
 2195 2200 2205
 Ser Ile Ala Ala Val Asn Gly Pro Glu Gln Val Val Ile Ala Gly Val
 2210 2215 2220
 Glu Gln Ala Val Gln Ala Ile Ala Ala Gly Phe Ala Ala Arg Gly Ala
 2225 2230 2235 2240
 Arg Thr Lys Arg Leu His Val Ser His Ala Ser His Ser Pro Leu Met
 2245 2250 2255
 Glu Pro Met Leu Glu Glu Phe Gly Arg Val Ala Ala Ser Val Thr Tyr
 2260 2265 2270
 Arg Arg Pro Ser Val Ser Leu Val Ser Asn Leu Ser Gly Lys Val Val
 2275 2280 2285

Ala Asp Glu Leu Ser Ala Pro Gly Tyr Trp Val Arg His Val Arg Glu
 2290 2295 2300
 Ala Val Arg Phe Ala Asp Gly Val Lys Ala Leu His Glu Ala Gly Ala
 2305 2310 2315 2320
 Gly Thr Phe Val Glu Val Gly Pro Lys Pro Thr Leu Leu Gly Leu Leu
 2325 2330 2335
 Pro Ala Cys Leu Pro Glu Ala Glu Pro Thr Leu Leu Ala Ser Leu Arg
 2340 2345 2350
 Ala Gly Arg Glu Glu Ala Ala Gly Val Leu Glu Ala Leu Gly Arg Leu
 2355 2360 2365
 Trp Ala Ala Gly Gly Ser Val Ser Trp Pro Gly Val Phe Pro Thr Ala
 2370 2375 2380
 Gly Arg Arg Val Pro Leu Pro Thr Tyr Pro Trp Gln Arg Gln Arg Tyr
 2385 2390 2395 2400
 Trp Pro Asp Ile Glu Pro Asp Ser Arg Arg His Ala Ala Ala Asp Pro
 2405 2410 2415
 Thr Gln Gly Trp Phe Tyr Arg Val Asp Trp Pro Glu Ile Pro Arg Ser
 2420 2425 2430
 Leu Gln Lys Ser Glu Glu Ala Ser Arg Gly Ser Trp Leu Val Leu Ala
 2435 2440 2445
 Asp Lys Gly Gly Val Gly Glu Ala Val Ala Ala Leu Ser Thr Arg
 2450 2455 2460
 Gly Leu Pro Cys Val Val Leu His Ala Pro Ala Glu Thr Ser Ala Thr
 2465 2470 2475 2480
 Ala Glu Leu Val Thr Glu Ala Ala Gly Gly Arg Ser Asp Trp Gln Val
 2485 2490 2495
 Val Leu Tyr Leu Trp Gly Leu Asp Ala Val Val Gly Ala Glu Ala Ser
 2500 2505 2510
 Ile Asp Glu Ile Gly Asp Ala Thr Arg Arg Ala Thr Ala Pro Val Leu
 2515 2520 2525
 Gly Leu Ala Arg Phe Leu Ser Thr Val Ser Cys Ser Pro Arg Leu Trp
 2530 2535 2540
 Val Val Thr Arg Gly Ala Cys Ile Val Gly Asp Glu Pro Ala Ile Ala
 2545 2550 2555 2560
 Pro Cys Gln Ala Ala Leu Trp Gly Met Gly Arg Val Ala Ala Leu Glu
 2565 2570 2575
 His Pro Gly Ala Trp Gly Gly Leu Val Asp Leu Asp Pro Arg Ala Ser
 2580 2585 2590
 Pro Pro Gln Ala Ser Pro Ile Asp Gly Glu Met Leu Val Thr Glu Leu
 2595 2600 2605
 Leu Ser Gln Glu Thr Glu Asp Gln Leu Ala Phe Arg His Gly Arg Arg
 2610 2615 2620
 His Ala Ala Arg Leu Val Ala Ala Pro Pro Gln Gly Gln Ala Ala Pro
 2625 2630 2635 2640

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Val Ser Leu Ser Ala Glu Ala Ser Tyr Leu Val Thr Gly Gly Leu Gly
 2645 2650 2655
 Gly Leu Gly Leu Ile Val Ala Gln Trp Leu Val Glu Leu Gly Ala Arg
 2660 2665 2670
 His Leu Val Leu Thr Ser Arg Arg Gly Leu Pro Asp Arg Gln Ala Trp
 2675 2680 2685
 Cys Glu Gln Gln Pro Pro Glu Ile Arg Ala Arg Ile Ala Ala Val Glu
 2690 2695 2700
 Ala Leu Glu Ala Arg Gly Ala Arg Val Thr Val Ala Ala Val Asp Val
 2705 2710 2715 2720
 Ala Asp Val Glu Pro Met Thr Ala Leu Val Ser Ser Val Glu Pro Pro
 2725 2730 2735
 Leu Arg Gly Val Val His Ala Ala Gly Val Ser Val Met Arg Pro Leu
 2740 2745 2750
 Ala Glu Thr Asp Glu Thr Leu Leu Glu Ser Val Leu Arg Pro Lys Val
 2755 2760 2765
 Ala Gly Ser Trp Leu Leu His Arg Leu Leu His Gly Arg Pro Leu Asp
 2770 2775 2780
 Leu Phe Val Leu Phe Ser Ser Gly Ala Ala Val Trp Gly Ser His Ser
 2785 2790 2795 2800
 Gln Gly Ala Tyr Ala Ala Ala Asn Ala Phe Leu Asp Gly Leu Ala His
 2805 2810 2815
 Leu Arg Arg Ser Gln Ser Leu Pro Ala Leu Ser Val Ala Trp Gly Leu
 2820 2825 2830
 Trp Ala Glu Gly Gly Met Ala Asp Ala Glu Ala His Ala Arg Leu Ser
 2835 2840 2845
 Asp Ile Gly Val Leu Pro Met Ser Thr Ser Ala Ala Leu Ser Ala Leu
 2850 2855 2860
 Gln Arg Leu Val Glu Thr Gly Ala Ala Gln Arg Thr Val Thr Arg Met
 2865 2870 2875 2880
 Asp Trp Ala Arg Phe Ala Pro Val Tyr Thr Ala Arg Gly Arg Arg Asn
 2885 2890 2895
 Leu Leu Ser Ala Leu Val Ala Gly Arg Asp Ile Ile Ala Pro Ser Pro
 2900 2905 2910
 Pro Ala Ala Ala Thr Arg Asn Trp Arg Gly Leu Ser Val Ala Glu Ala
 2915 2920 2925
 Arg Val Ala Leu His Glu Ile Val His Gly Ala Val Ala Arg Val Leu
 2930 2935 2940
 Gly Phe Leu Asp Pro Ser Ala Leu Asp Pro Gly Met Gly Phe Asn Glu
 2945 2950 2955 2960
 Gln Gly Leu Asp Ser Leu Met Ala Val Glu Ile Arg Asn Leu Leu Gln
 2965 2970 2975
 Ala Glu Leu Asp Val Arg Leu Ser Thr Thr Leu Ala Phe Asp His Pro
 2980 2985 2990

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Thr Val Gln Arg Leu Val Glu His Leu Leu Val Asp Val Leu Lys Leu
 2995 3000 3005
 Glu Asp Arg Ser Asp Thr Gln His Val Arg Ser Leu Ala Ser Asp Glu
 3010 3015 3020
 Pro Ile Ala Ile Val Gly Ala Ala Cys Arg Phe Pro Gly Gly Val Glu
 3025 3030 3035 3040
 Asp Leu Glu Ser Tyr Trp Gln Leu Leu Ala Glu Gly Val Val Val Ser
 3045 3050 3055
 Ala Glu Val Pro Ala Asp Arg Trp Asp Ala Ala Asp Trp Tyr Asp Pro
 3060 3065 3070
 Asp Pro Glu Ile Pro Gly Arg Thr Tyr Val Thr Lys Gly Ala Phe Leu
 3075 3080 3085
 Arg Asp Leu Gln Arg Leu Asp Ala Thr Phe Phe Arg Ile Ser Pro Arg
 3090 3095 3100
 Glu Ala Met Ser Leu Asp Pro Gln Gln Arg Leu Leu Leu Glu Val Ser
 3105 3110 3115 3120
 Trp Glu Ala Leu Glu Ser Ala Gly Ile Ala Pro Asp Thr Leu Arg Asp
 3125 3130 3135
 Ser Pro Thr Gly Val Phe Val Gly Ala Gly Pro Asn Glu Tyr Tyr Thr
 3140 3145 3150
 Gln Arg Leu Arg Gly Phe Thr Asp Gly Ala Ala Gly Leu Tyr Gly Gly
 3155 3160 3165
 Thr Gly Asn Met Leu Ser Val Thr Ala Gly Arg Leu Ser Phe Phe Leu
 3170 3175 3180
 Gly Leu His Gly Pro Thr Leu Ala Met Asp Thr Ala Cys Ser Ser Ser
 3185 3190 3195 3200
 Leu Val Ala Leu His Leu Ala Cys Gln Ser Leu Arg Leu Gly Glu Cys
 3205 3210 3215
 Asp Gln Ala Leu Val Gly Gly Val Asn Val Leu Leu Ala Pro Glu Thr
 3220 3225 3230
 Phe Val Leu Leu Ser Arg Met Arg Ala Leu Ser Pro Asp Gly Arg Cys
 3235 3240 3245
 Lys Thr Phe Ser Ala Asp Ala Asp Gly Tyr Ala Arg Gly Glu Gly Cys
 3250 3255 3260
 Ala Val Val Val Leu Lys Arg Leu Arg Asp Ala Gln Arg Ala Gly Asp
 3265 3270 3275 3280
 Ser Ile Leu Ala Leu Ile Arg Gly Ser Ala Val Asn His Asp Gly Pro
 3285 3290 3295
 Ser Ser Gly Leu Thr Val Pro Asn Gly Pro Ala Gln Gln Ala Leu Leu
 3300 3305 3310
 Arg Gln Ala Leu Ser Gln Ala Gly Val Ser Pro Val Asp Val Asp Phe
 3315 3320 3325
 Val Glu Cys His Gly Thr Gly Thr Ala Leu Gly Asp Pro Ile Glu Val
 3330 3335 3340

Gln Ala Leu Ser Glu Val Tyr Gly Pro Gly Arg Ser Gly Asp Arg Pro
 3345 3350 3355 3360
 Leu Val Leu Gly Ala Ala Lys Ala Asn Val Ala His Leu Glu Ala Ala
 3365 3370 3375
 Ser Gly Leu Ala Ser Leu Leu Lys Ala Val Leu Ala Leu Arg His Glu
 3380 3385 3390
 Gln Ile Pro Ala Gln Pro Glu Leu Gly Glu Leu Asn Pro His Leu Pro
 3395 3400 3405
 Trp Asn Thr Leu Pro Val Ala Val Pro Arg Lys Ala Val Pro Trp Gly
 3410 3415 3420
 Arg Gly Ala Arg Pro Arg Arg Ala Gly Val Ser Ala Phe Gly Leu Ser
 3425 3430 3435 3440
 Gly Thr Asn Val His Val Val Leu Glu Glu Ala Pro Glu Val Glu Pro
 3445 3450 3455
 Ala Pro Ala Ala Pro Ala Arg Pro Val Glu Leu Val Val Leu Ser Ala
 3460 3465 3470
 Lys Ser Ala Ala Ala Leu Asp Ala Ala Ala Ala Arg Leu Ser Ala His
 3475 3480 3485
 Leu Ser Ala His Pro Glu Leu Ser Leu Gly Asp Val Ala Phe Ser Leu
 3490 3495 3500
 Ala Thr Thr Arg Ser Pro Met Glu His Arg Leu Ala Ile Ala Thr Thr
 3505 3510 3515 3520
 Ser Arg Glu Ala Leu Arg Gly Ala Leu Asp Ala Ala Gln Gln Lys
 3525 3530 3535
 Thr Pro Gln Gly Ala Val Arg Gly Lys Ala Val Ser Ser Arg Gly Lys
 3540 3545 3550
 Leu Ala Phe Leu Phe Thr Gly Gln Gly Ala Gln Met Pro Gly Met Gly
 3555 3560 3565
 Arg Gly Leu Tyr Glu Thr Trp Pro Ala Phe Arg Glu Ala Phe Asp Arg
 3570 3575 3580
 Cys Val Ala Leu Phe Asp Arg Glu Ile Asp Gln Pro Leu Arg Glu Val
 3585 3590 3595 3600
 Met Trp Ala Ala Pro Gly Leu Ala Gln Ala Ala Arg Leu Asp Gln Thr
 3605 3610 3615
 Ala Tyr Ala Gln Pro Ala Leu Phe Ala Leu Glu Tyr Ala Leu Ala Ala
 3620 3625 3630
 Leu Trp Arg Ser Trp Gly Val Glu Pro His Val Leu Leu Gly His Ser
 3635 3640 3645
 Ile Gly Glu Leu Val Ala Ala Cys Val Ala Gly Val Phe Ser Leu Glu
 3650 3655 3660
 Asp Ala Val Arg Leu Val Ala Ala Arg Gly Arg Leu Met Gln Ala Leu
 3665 3670 3675 3680
 Pro Ala Gly Gly Ala Met Val Ala Ile Ala Ala Ser Glu Ala Glu Val
 3685 3690 3695

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Ala Ala Ser Val Ala Pro His Ala Ala Thr Val Ser Ile Ala Ala Val
3700 3705 3710

Asn Gly Pro Asp Ala Val Val Ile Ala Gly Ala Glu Val Gln Val Leu
3715 3720 3725

Ala Leu Gly Ala Thr Phe Ala Ala Arg Gly Ile Arg Thr Lys Arg Leu
3730 3735 3740

Ala Val Ser His Ala Phe His Ser Pro Leu Met Asp Pro Met Leu Glu
3745 3750 3755 3760

Asp Phe Gln Arg Val Ala Ala Thr Ile Ala Tyr Arg Ala Pro Asp Arg
3765 3770 3775

Pro Val Val Ser Asn Val Thr Gly His Val Ala Gly Pro Glu Ile Ala
3780 3785 3790

Thr Pro Glu Tyr Trp Val Arg His Val Arg Ser Ala Val Arg Phe Gly
3795 3800 3805

Asp Gly Ala Lys Ala Leu His Ala Ala Gly Ala Ala Thr Phe Val Glu
3810 3815 3820

Val Gly Pro Lys Pro Val Leu Leu Gly Leu Leu Pro Ala Cys Leu Gly
3825 3830 3835 3840

Glu Ala Asp Ala Val Leu Val Pro Ser Leu Arg Ala Asp Arg Ser Glu
3845 3850 3855

Cys Glu Val Val Leu Ala Ala Leu Gly Ala Trp Tyr Ala Trp Gly Gly
3860 3865 3870

Ala Leu Asp Trp Lys Gly Val Phe Pro Asp Gly Ala Arg Val Ala
3875 3880 3885

Leu Pro Met Tyr Pro Trp Gln Arg Glu Arg His Trp Met Asp Leu Thr
3890 3895 3900

Pro Arg Ser Ala Ala Pro Ala Gly Ile Ala Gly Arg Trp Pro Leu Ala
3905 3910 3915 3920

Gly Val Gly Leu Cys Met Pro Gly Ala Val Leu His His Val Leu Ser
3925 3930 3935

Ile Gly Pro Arg His Gln Pro Phe Leu Gly Asp His Leu Val Phe Gly
3940 3945 3950

Lys Val Val Val Pro Gly Ala Phe His Val Ala Val Ile Leu Ser Ile
3955 3960 3965

Ala Ala Glu Arg Trp Pro Glu Arg Ala Ile Glu Leu Thr Gly Val Glu
3970 3975 3980

Phe Leu Lys Ala Ile Ala Met Glu Pro Asp Gln Glu Val Glu Leu His
3985 3990 3995 4000

Ala Val Leu Thr Pro Glu Ala Ala Gly Asp Gly Tyr Leu Phe Glu Leu
4005 4010 4015

Ala Thr Leu Ala Ala Pro Glu Thr Glu Arg Arg Trp Thr Thr His Ala
4020 4025 4030

Arg Gly Arg Val Gln Pro Thr Asp Gly Ala Pro Gly Ala Leu Pro Arg
4035 4040 4045

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Leu Glu Val Leu Glu Asp Arg Ala Ile Gln Pro Leu Asp Phe Ala Gly
 4050 4055 4060
 Phe Leu Asp Arg Leu Ser Ala Val Arg Ile Gly Trp Gly Pro Leu Trp
 4065 4070 4075 4080
 Arg Trp Leu Gln Asp Gly Arg Val Gly Asp Glu Ala Ser Leu Ala Thr
 4085 4090 4095
 Leu Val Pro Thr Tyr Pro Asn Ala His Asp Val Ala Pro Leu His Pro
 4100 4105 4110
 Ile Leu Leu Asp Asn Gly Phe Ala Val Ser Leu Leu Ser Thr Arg Ser
 4115 4120 4125
 Glu Pro Glu Asp Asp Gly Thr Pro Pro Leu Pro Phe Ala Val Glu Arg
 4130 4135 4140
 Val Arg Trp Trp Arg Ala Pro Val Gly Arg Val Arg Cys Gly Gly Val
 4145 4150 4155 4160
 Pro Arg Ser Gln Ala Phe Gly Val Ser Ser Phe Val Leu Val Asp Glu
 4165 4170 4175
 Thr Gly Glu Val Val Ala Glu Val Glu Gly Phe Val Cys Arg Arg Ala
 4180 4185 4190
 Pro Arg Glu Val Phe Leu Arg Gln Glu Ser Gly Ala Ser Thr Ala Ala
 4195 4200 4205
 Leu Tyr Arg Leu Asp Trp Pro Glu Ala Pro Leu Pro Asp Ala Pro Ala
 4210 4215 4220
 Glu Arg Ile Glu Glu Ser Trp Val Val Ala Ala Pro Gly Ser Glu
 4225 4230 4235 4240
 Met Ala Ala Ala Leu Ala Thr Arg Leu Asn Arg Cys Val Leu Ala Glu
 4245 4250 4255
 Pro Lys Gly Leu Glu Ala Ala Leu Ala Gly Val Ser Pro Ala Gly Val
 4260 4265 4270
 Ile Cys Leu Trp Glu Ala Gly Ala His Glu Glu Ala Pro Ala Ala Ala
 4275 4280 4285
 Gln Arg Val Ala Thr Glu Gly Leu Ser Val Val Gln Ala Leu Arg Asp
 4290 4295 4300
 Arg Ala Val Arg Leu Trp Trp Val Thr Met Gly Ala Val Ala Val Glu
 4305 4310 4315 4320
 Ala Gly Glu Arg Val Gln Val Ala Thr Ala Pro Val Trp Gly Leu Gly
 4325 4330 4335
 Arg Thr Val Met Gln Glu Arg Pro Glu Leu Ser Cys Thr Leu Val Asp
 4340 4345 4350
 Leu Glu Pro Glu Ala Asp Ala Ala Arg Ser Ala Asp Val Leu Leu Arg.
 4355 4360 4365
 Glu Leu Gly Arg Ala Asp Asp Glu Thr Gln Val Ala Phe Arg Ser Gly
 4370 4375 4380
 Lys Arg Arg Val Ala Arg Leu Val Lys Ala Thr Thr Pro Glu Gly Leu
 4385 4390 4395 4400

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Leu Val Pro Asp Ala Glu Ser Tyr Arg Leu Glu Ala Gly Gln Lys Gly
 4405 4410 4415
 Thr Leu Asp Gln Leu Arg Leu Ala Pro Ala Gln Arg Arg Ala Pro Gly
 4420 4425 4430
 Pro Gly Gly Val Glu Ile Lys Val Thr Ala Ser Gly Leu Asn Phe Arg
 4435 4440 4445
 Thr Val Leu Ala Val Leu Gly Met Tyr Pro Gly Asp Ala Gly Pro Met
 4450 4455 4460
 Gly Gly Asp Cys Ala Gly Val Ala Thr Ala Val Gly Gln Gly Val Arg
 4465 4470 4475 4480
 His Val Ala Val Gly Asp Ala Val Met Thr Leu Gly Thr Leu His Arg
 4485 4490 4495
 Phe Val Thr Val Asp Ala Arg Leu Val Val Arg Gln Pro Ala Gly Leu
 4500 4505 4510
 Thr Pro Ala Gln Ala Ala Thr Val Pro Val Ala Phe Leu Thr Ala Trp
 4515 4520 4525
 Leu Ala Leu His Asp Leu Gly Asn Leu Arg Arg Gly Glu Arg Val Leu
 4530 4535 4540
 Ile His Ala Ala Ala Gly Gly Val Gly Met Ala Ala Val Gln Ile Ala
 4545 4550 4555 4560
 Arg Trp Ile Gly Ala Glu Val Phe Ala Thr Ala Ser Pro Ser Lys Trp
 4565 4570 4575
 Ala Ala Val Gln Ala Met Gly Val Pro Arg Thr His Ile Ala Ser Ser
 4580 4585 4590
 Arg Thr Leu Glu Phe Ala Glu Thr Phe Arg Gln Val Thr Gly Gly Arg
 4595 4600 4605
 Gly Val Asp Val Val Leu Asn Ala Leu Ala Gly Glu Phe Val Asp Ala
 4610 4615 4620
 Ser Leu Ser Leu Leu Ser Thr Gly Gly Arg Phe Leu Glu Met Gly Lys
 4625 4630 4635 4640
 Thr Asp Ile Arg Asp Arg Ala Ala Val Ala Ala His Pro Gly Val
 4645 4650 4655
 Arg Tyr Arg Val Phe Asp Ile Leu Glu Leu Ala Pro Asp Arg Thr Arg
 4660 4665 4670
 Glu Ile Leu Glu Arg Val Val Glu Gly Phe Ala Ala Gly His Leu Arg
 4675 4680 4685
 Ala Leu Pro Val His Ala Phe Ala Ile Thr Lys Ala Glu Ala Ala Phe
 4690 4695 4700
 Arg Phe Met Ala Gln Ala Arg His Gln Gly Lys Val Val Leu Leu Pro
 4705 4710 4715 4720
 Ala Pro Ser Ala Ala Pro Leu Ala Pro Thr Gly Thr Val Leu Leu Thr
 4725 4730 4735
 Gly Gly Leu Gly Ala Leu Gly Leu His Val Ala Arg Trp Leu Ala Gln
 4740 4745 4750

Gln Gly Val Pro His Met Val Leu Thr Gly Arg Arg Gly Leu Asp Thr
 4755 4760 4765
 Pro Gly Ala Ala Lys Ala Val Ala Glu Ile Glu Ala Leu Gly Ala Arg
 4770 4775 4780
 Val Thr Ile Ala Ala Ser Asp Val Ala Asp Arg Asn Ala Leu Glu Ala
 4785 4790 4795 4800
 Val Leu Gln Ala Ile Pro Ala Glu Trp Pro Leu Gln Gly Val Ile His
 4805 4810 4815
 Ala Ala Gly Ala Leu Asp Asp Gly Val Leu Asp Glu Gln Thr Thr Asp
 4820 4825 4830
 Arg Phe Ser Arg Val Leu Ala Pro Lys Val Thr Gly Ala Trp Asn Leu
 4835 4840 4845
 His Glu Leu Thr Ala Gly Asn Asp Leu Ala Phe Phe Val Leu Phe Ser
 4850 4855 4860
 Ser Met Ser Gly Leu Leu Gly Ser Ala Gly Gln Ser Asn Tyr Ala Ala
 4865 4870 4875 4880
 Ala Asn Thr Phe Leu Asp Ala Leu Ala Ala His Arg Arg Ala Glu Gly
 4885 4890 4895
 Leu Ala Ala Gln Ser Leu Ala Trp Gly Pro Trp Ser Asp Gly Met
 4900 4905 4910
 Ala Ala Gly Leu Ser Ala Ala Leu Gln Ala Arg Leu Ala Arg His Gly
 4915 4920 4925
 Met Gly Ala Leu Ser Pro Ala Gln Gly Thr Ala Leu Leu Gly Gln Ala
 4930 4935 4940
 Leu Ala Arg Pro Glu Thr Gln Leu Gly Ala Met Ser Leu Asp Val Arg
 4945 4950 4955 4960
 Ala Ala Ser Gln Ala Ser Gly Ala Ala Val Pro Pro Val Trp Arg Ala
 4965 4970 4975
 Leu Val Arg Ala Glu Ala Arg His Thr Ala Ala Gly Ala Gln Gly Ala
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 Asp Ser Leu Thr Ala Val Glu Leu Arg Asn Val Leu Gly Gln Arg Val
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 Gly Ala Thr Leu Pro Ala Thr Leu Ala Phe Asp His Pro Thr Val Asp
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 Ala Leu Thr Arg Trp Leu Leu Asp Lys Val Leu Ala Val Ala Glu Pro
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 Ser Val Ser Ser Ala Lys Ser Ser Pro Gln Val Ala Leu Asp Glu Pro
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Ile Ala Ile Ile Gly Ile Gly Cys Arg Phe Pro Gly Gly Val Ala Asp
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 Pro Glu Ser Phe Trp Arg Leu Leu Glu Glu Gly Ser Asp Ala Val Val
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 Pro Asp Val Arg Gly Lys Met Thr Thr Arg Phe Gly Gly Phe Leu Ser
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 Gly Thr Gly Thr Thr Leu Gly Asp Pro Ile Glu Val Gln Ala Leu Gly
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 Ala Val Leu Ala Gln Gly Arg Pro Ser Asp Arg Pro Leu Val Ile Gly
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 Ser Val Lys Ser Asn Ile Gly His Thr Gln Ala Ala Ala Gly Val Ala
 5445 5450 5455

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Gly Val Ile Lys Val Ala Leu Ala Leu Glu Arg Gly Leu Ile Pro Arg
 5460 5465 5470
 Ser Leu His Phe Asp Ala Pro Asn Pro His Ile Pro Trp Ser Glu Leu
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 Ala Val Gln Val Ala Ala Lys Pro Val Glu Trp Thr Arg Asn Gly Val
 5490 5495 5500
 Pro Arg Arg Ala Gly Val Ser Ser Phe Gly Val Ser Gly Thr Asn Ala
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 His Val Val Leu Glu Glu Ala Pro Ala Ala Ala Phe Ala Pro Ala Ala
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 Ala Arg Ser Ala Glu Leu Phe Val Leu Ser Ala Lys Ser Ala Ala Ala
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 Leu Asp Ala Gln Ala Ala Arg Leu Ser Ala His Val Val Ala His Pro
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 Glu Leu Gly Leu Gly Asp Leu Ala Phe Ser Leu Ala Thr Thr Arg Ser
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 Pro Met Thr Tyr Arg Leu Ala Val Ala Ala Thr Ser Arg Glu Ala Leu
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 Ser Ala Ala Leu Asp Thr Ala Ala Gln Gly Gln Ala Pro Pro Ala Ala
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 Ala Arg Gly His Ala Ser Thr Gly Ser Ala Pro Lys Val Val Phe Val
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 Phe Pro Gly Gln Gly Ser Gln Trp Leu Gly Met Gly Gln Lys Leu Leu
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 Ser Glu Glu Pro Val Phe Arg Asp Ala Leu Ser Ala Cys Asp Arg Ala
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 Ile Gln Ala Glu Ala Gly Trp Ser Leu Leu Ala Glu Leu Ala Ala Asp
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 Glu Thr Thr Ser Gln Leu Gly Arg Ile Asp Val Val Gln Pro Ala Leu
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 Val Val Glu Leu Ser Leu Ala Glu Ala Glu Ala Ala Leu Leu Gly Tyr
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 Leu Ala Gly Glu Pro Ala Ala Leu Ala Glu Val Leu Ala Ile Leu Ala
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 Ser Thr Ile Met Ala Gly Pro Glu Leu Val Ala Ser Tyr Trp Ala Asp
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 Glu Asp Gly His Gly Leu Phe Val Glu Met Ser Pro His Pro Ile Leu
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 Thr Thr Ser Val Glu Glu Ile Arg Arg Ala Thr Lys Arg Glu Gly Val
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 Arg Leu Phe Ser Ala Gly Gly Ala Gly Leu Arg Arg Val Pro Leu Pro
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 Thr Tyr Pro Trp Gln Arg Glu Arg Tyr Trp Val Asp Ala Pro Thr Gly
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 Gly Ala Ala Gly Gly Ser Arg Phe Ala His Ala Gly Ser His Pro Leu
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 Glu Thr Thr Leu Asp Leu Lys Arg Leu Pro Trp Leu Gly Asp His Arg
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 His Val Ala Ser Arg Val Pro Gly His Gly Gly Ala Ala Phe Arg Ser
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 Ala Ala Ala Thr Tyr Ala Ala Leu Ala Glu Met Gly Leu Glu Tyr Gly
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Pro Ala Phe Gln Gly Leu Val Glu Leu Trp Arg Gly Glu Gly Glu Ala
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 Leu Gly Arg Val Arg Leu Pro Glu Ala Ala Gly Ser Pro Ala Ala Cys
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 Phe Ala Asp Arg Gly Glu Ala Thr Pro Trp Val Pro Val Glu Ile Gly
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 Ser Leu Arg Trp Phe Gln Arg Pro Ser Gly Glu Leu Trp Cys His Ala
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 Arg Ser Val Ser His Gly Lys Pro Thr Pro Asp Arg Arg Ser Thr Asp
 6245 6250 6255
 Phe Trp Val Val Asp Ser Thr Gly Ala Ile Val Ala Glu Ile Ser Gly
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 Asp Trp Phe Met Glu Pro Ala Trp Glu Pro Thr Ala Val Pro Gly Ser
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 Glu Val Met Ala Gly Arg Trp Leu Leu Ile Gly Ser Gly Gly Gly Leu
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 Trp Leu Val Thr Arg Gly Ala Gln Ala Ile Gly Ala Gly Asp Val Ser
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 His Ala Glu Leu Arg Cys Ala Arg Ile Asp Leu Asp Pro Ala Arg Arg
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 Asp Gly Glu Val Asp Glu Leu Leu Ala Glu Leu Leu Ala Asp Asp Ala
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 Glu Glu Glu Val Ala Phe Arg Gly Gly Glu Arg Arg Val Ala Arg Leu
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 Val Arg Arg Leu Pro Glu Thr Asp Cys Arg Glu Lys Ile Glu Pro Ala
 6500 6505 6510

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 Asp Leu Val Leu Arg Ala Thr Glu Arg Arg Pro Pro Gly Pro Gly Glu
 6530 6535 6540
 Val Glu Ile Ala Val Glu Ala Ala Gly Leu Asn Phe Leu Asp Val Met
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 Gly Thr His Val Thr Ile Asp Ala Arg Met Leu Ala Pro Arg Pro Ala
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 Lys Thr Asp Ile Tyr Ala Asp Arg Ser Leu Gly Leu Ala His Phe Arg
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 Lys Leu Val Leu Ala Leu Glu Asp Pro Asp Val Arg Ile Arg Val Pro
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 Gly Glu Ser Gly Val Ala Ile Arg Ala Asp Gly Ala Tyr Leu Val Thr
 6850 6855 6860

Gly Gly Leu Gly Gly Leu Gly Leu Ser Val Ala Gly Trp Leu Ala Glu
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 Gln Gly Ala Gly His Leu Val Leu Val Gly Arg Ser Gly Ala Val Ser
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 Ala Glu Gln Gln Thr Ala Val Ala Ala Leu Glu Ala His Gly Ala Arg
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 Val Thr Val Ala Arg Ala Asp Val Ala Asp Arg Ala Gln Met Glu Arg
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 His Ala Ala Gly Ile Leu Asp Asp Gly Leu Leu Met Gln Gln Thr Pro
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 Ala Arg Phe Arg Ala Val Met Ala Pro Lys Val Arg Gly Ala Leu His
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 Gly Leu Pro Ala Leu Ser Ile Asp Trp Gly Leu Phe Ala Asp Val Gly
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 Leu Ala Ala Gly Gln Gln Asn Arg Gly Ala Arg Leu Val Thr Arg Gly
 7045 7050 7055
 Thr Arg Ser Leu Thr Pro Asp Glu Gly Leu Trp Ala Leu Glu Arg Leu
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 Leu Asp Gly Asp Arg Thr Gln Ala Gly Val Met Pro Phe Asp Val Arg
 7075 7080 7085
 Gln Trp Val Glu Phe Tyr Pro Ala Ala Ala Ser Ser Arg Arg Leu Ser
 7090 7095 7100
 Arg Leu Met Thr Ala Arg Arg Val Ala Ser Gly Arg Leu Ala Gly Asp
 7105 7110 7115 7120
 Arg Asp Leu Leu Glu Arg Leu Ala Thr Ala Glu Ala Gly Ala Arg Ala
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 Gly Met Leu Gln Glu Val Val Arg Ala Gln Val Ser Gln Val Leu Arg
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 Met Asp Ser Leu Met Gly Leu Glu Leu Arg Asn Arg Ile Glu Ala Val
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 Leu Gly Ile Thr Met Pro Ala Thr Leu Leu Trp Thr Tyr Pro Thr Val
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 Ala Ala Leu Ser Ala His Leu Ala Ser His Val Val Ser Thr Gly Asp
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Gly Glu Ser Ala Arg Pro Pro Asp Thr Gly Ser Val Ala Pro Thr Thr
7220 7225 7230

His Glu Val Ala Ser Leu Asp Glu Asp Gly Leu Phe Ala Leu Ile Asp
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Glu Ser Leu Ala Arg Ala Gly Lys Arg
7250 7255

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<211> 3798

<212> PRT

<213> Sorangium cellulosum

<400> 6

Val Thr Asp Arg Glu Gly Gln Leu Leu Glu Arg Leu Arg Glu Val Thr
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Leu Ala Leu Arg Lys Thr Leu Asn Glu Arg Asp Thr Leu Glu Leu Glu
20 25 30

Lys Thr Glu Pro Ile Ala Ile Val Gly Ile Gly Cys Arg Phe Pro Gly
35 40 45

Gly Ala Gly Thr Pro Glu Ala Phe Trp Glu Leu Leu Asp Asp Gly Arg
50 55 60

Asp Ala Ile Arg Pro Leu Glu Glu Arg Trp Ala Leu Val Gly Val Asp
65 70 75 80

Pro Gly Asp Asp Val Pro Arg Trp Ala Gly Leu Leu Thr Glu Ala Ile
85 90 95

Asp Gly Phe Asp Ala Ala Phe Phe Gly Ile Ala Pro Arg Glu Ala Arg
100 105 110

Ser Leu Asp Pro Gln His Arg Leu Leu Glu Val Ala Trp Glu Gly
115 120 125

Phe Glu Asp Ala Gly Ile Pro Pro Arg Ser Leu Val Gly Ser Arg Thr
130 135 140

Gly Val Phe Val Gly Val Cys Ala Thr Glu Tyr Leu His Ala Ala Val
145 150 155 160

Ala His Gln Pro Arg Glu Glu Arg Asp Ala Tyr Ser Thr Thr Gly Asn
165 170 175

Met Leu Ser Ile Ala Ala Gly Arg Leu Ser Tyr Thr Leu Gly Leu Gln
180 185 190

Gly Pro Cys Leu Thr Val Asp Thr Ala Cys Ser Ser Ser Leu Val Ala
195 200 205

Ile His Leu Ala Cys Arg Ser Leu Arg Ala Arg Glu Ser Asp Leu Ala
210 215 220

Leu Ala Gly Gly Val Asn Met Leu Leu Ser Pro Asp Thr Met Arg Ala
225 230 235 240

Leu Ala Arg Thr Gln Ala Leu Ser Pro Asn Gly Arg Cys Gln Thr Phe
245 250 255

Asp Ala Ser Ala Asn Gly Phe Val Arg Gly Glu Gly Cys Gly Leu Ile

260	265	270
Val Leu Lys Arg Leu Ser Asp 275	Ala Arg Arg Asp Gly Asp 280	Arg Arg Ile Trp 285
Ala Leu Ile Arg Gly Ser 290	Ala Ile Asn Gln Asp Gly 295	Arg Ser Thr Gly 300
Leu Thr Ala Pro Asn Val 305	Leu Ala Gln Gly 310	Ala Leu Leu Arg Glu Ala 315 320
Leu Arg Asn Ala Gly 325	Val Glu Ala Glu Ala 330	Ile Gly Tyr Ile Glu Thr 335
His Gly Ala Ala Thr Ser 340	Leu Gly Asp Pro Ile Glu 345	Ile Glu Ala Leu 350
Arg Ala Val Val Gly Pro 355	Ala Arg Ala Asp Gly Ala 360	Arg Cys Val Leu 365
Gly Ala Val Lys Thr Asn 370	Leu Gly His Leu Glu Gly 375	Ala Ala Gly Val 380
Ala Gly Leu Ile Lys Ala 385	Thr Leu Ser Leu His His 390	Glu Arg Ile Pro 395 400
Arg Asn Leu Asn Phe Arg 405	Thr Leu Asn Pro Ile Arg 410	Ile Glu Gly 415
Thr Ala Leu Ala Leu Ala 420	Thr Glu Pro Val Pro Trp 425	Pro Arg Thr Gly 430
Arg Thr Arg Phe Ala Gly 435	Val Ser Ser Phe Gly Met 440	Ser Gly Thr Asn 445
Ala His Val Val Leu Glu 450	Glu Glu Ala Pro Ala Val 455	Glu Pro Glu Ala Ala 460
Ala Pro Glu Arg Ala Ala 465	Glu Leu Phe Val Leu Ser 470	Ala Lys Ser Ala 475 480
Ala Ala Leu Asp Ala 485	Gln Ala Ala Arg Leu 490	Arg Asp His Leu Glu Lys 495
His Val Glu Leu Gly 500	Leu Gly Asp Val Ala Phe 505	Ser Leu Ala Thr Thr 510
Arg Ser Ala Met Glu His 515	Arg Leu Ala Val Ala Ala 520	Ser Ser Arg Glu 525
Ala Leu Arg Gly Ala Leu 530	Ser Ala Ala Ala Gln Gly 535	His Thr Pro Pro 540
Gly Ala Val Arg Gly Arg 545	Ala Ser Gly Gly Ser Ala 550	Pro Lys Val Val 555 560
Phe Val Phe Pro Gly 565	Gln Gly Ser Gln Trp 570	Val Gly Met Gly Arg Lys 575
Leu Met Ala Glu Glu Pro 580	Val Phe Arg Ala Ala Leu 585	Glu Gly Cys Asp 590
Arg Ala Ile Glu Ala Glu 595	Ala Gly Trp Ser Leu Leu 600	Gly Glu Leu Ser 605
Ala Asp Glu Ala Ala Ser 610	Gln Leu Gly Arg Ile Asp 615	Val Val Gln Pro 620

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610	615	620
Val Leu Phe Ala Met Glu Val Ala Leu Ser Ala Leu Trp Arg Ser Trp		
625	630	635 640
Gly Val Glu Pro Glu Ala Val Val Gly His Ser Met Gly Glu Val Ala		
	645	650 655
Ala Ala His Val Ala Gly Ala Leu Ser Leu Glu Asp Ala Val Ala Ile		
	660	665 670
Ile Cys Arg Arg Ser Arg Leu Leu Arg Arg Ile Ser Gly Gln Gly Glu		
	675	680 685
Met Ala Leu Val Glu Leu Ser Leu Glu Glu Ala Glu Ala Ala Leu Arg		
	690	695 700
Gly His Glu Gly Arg Leu Ser Val Ala Val Ser Asn Ser Pro Arg Ser		
	705	710 715 720
Thr Val Leu Ala Gly Glu Pro Ala Ala Leu Ser Glu Val Leu Ala Ala		
	725	730 735
Leu Thr Ala Lys Gly Val Phe Trp Arg Gln Val Lys Val Asp Val Ala		
	740	745 750
Ser His Ser Pro Gln Val Asp Pro Leu Arg Glu Glu Leu Ile Ala Ala		
	755	760 765
Leu Gly Ala Ile Arg Pro Arg Ala Ala Ala Val Pro Met Arg Ser Thr		
	770	775 780
Val Thr Gly Gly Val Ile Ala Gly Pro Glu Leu Gly Ala Ser Tyr Trp		
	785	790 795
Ala Asp Asn Leu Arg Gln Pro Val Arg Phe Ala Ala Ala Ala Gln Ala		
	805	810 815
Leu Leu Glu Gly Gly Pro Ala Leu Phe Ile Glu Met Ser Pro His Pro		
	820	825 830
Ile Leu Val Pro Pro Leu Asp Glu Ile Gln Thr Ala Ala Glu Gln Gly		
	835	840 845
Gly Ala Ala Val Gly Ser Leu Arg Arg Gly Gln Asp Glu Arg Ala Thr		
	850	855 860
Leu Leu Glu Ala Leu Gly Thr Leu Trp Ala Ser Gly Tyr Pro Val Ser		
	865	870 875 880
Trp Ala Arg Leu Phe Pro Ala Gly Gly Arg Arg Val Pro Leu Pro Thr		
	885	890 895
Tyr Pro Trp Gln His Glu Arg Cys Trp Ile Glu Val Glu Pro Asp Ala		
	900	905 910
Arg Arg Leu Ala Ala Ala Asp Pro Thr Lys Asp Trp Phe Tyr Arg Thr		
	915	920 925
Asp Trp Pro Glu Val Pro Arg Ala Ala Pro Lys Ser Glu Thr Ala His		
	930	935 940
Gly Ser Trp Leu Leu Leu Ala Asp Arg Gly Gly Val Gly Glu Ala Val		
	945	950 955 960
Ala Ala Ala Leu Ser Thr Arg Gly Leu Ser Cys Thr Val Leu His Ala		

965										970										975																																					
Ser	Ala	Asp	Ala	Ser	Thr	Val	Ala	Glu	Gln	Val	Ser	Glu	Ala	Ala	Ser					Ser	Ala	Asp	Ala	Ser	Thr	Val	Ala	Glu	Gln	Val	Ser	Glu	Ala	Ala	Ser				Ser	Ala	Asp	Ala	Ser	Thr	Val	Ala	Glu	Gln	Val	Ser	Glu	Ala	Ala	Ser			
			980																				980																		980																
Arg	Arg	Asn	Asp	Trp	Gln	Gly	Val	Leu	Tyr	Leu	Trp	Gly	Leu	Asp	Ala					Arg	Arg	Asn	Asp	Trp	Gln	Gly	Val	Leu	Tyr	Leu	Trp	Gly	Leu	Asp	Ala				Arg	Arg	Asn	Asp	Trp	Gln	Gly	Val	Leu	Tyr	Leu	Trp	Gly	Leu	Asp	Ala			
			995					1000															995					1000													995					1000											
Val	Val	Asp	Ala	Gly	Ala	Ser	Ala	Asp	Glu	Val	Ser	Glu	Ala	Thr	Arg					Val	Val	Asp	Ala	Gly	Ala	Ser	Ala	Asp	Glu	Val	Ser	Glu	Ala	Thr	Arg				Val	Val	Asp	Ala	Gly	Ala	Ser	Ala	Asp	Glu	Val	Ser	Glu	Ala	Thr	Arg			
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Arg	Ala	Thr	Ala	Pro	Val	Leu	Gly	Leu	Val	Arg	Phe	Leu	Ser	Ala	Ala					Arg	Ala	Thr	Ala	Pro	Val	Leu	Gly	Leu	Val	Arg	Phe	Leu	Ser	Ala	Ala				Arg	Ala	Thr	Ala	Pro	Val	Leu	Gly	Leu	Val	Arg	Phe	Leu	Ser	Ala	Ala			
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Pro	His	Pro	Pro	Arg	Phe	Trp	Val	Val	Thr	Arg	Gly	Ala	Cys	Thr	Val					Pro	His	Pro	Pro	Arg	Phe	Trp	Val	Val	Thr	Arg	Gly	Ala	Cys	Thr	Val				Pro	His	Pro	Pro	Arg	Phe	Trp	Val	Val	Thr	Arg	Gly	Ala	Cys	Thr	Val			
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Gly	Gly	Glu	Pro	Glu	Ala	Ser	Leu	Cys	Gln	Ala	Ala	Leu	Trp	Gly	Leu					Gly	Gly	Glu	Pro	Glu	Ala	Ser	Leu	Cys	Gln	Ala	Ala	Leu	Trp	Gly	Leu				Gly	Gly	Glu	Pro	Glu	Ala	Ser	Leu	Cys	Gln	Ala	Ala	Leu	Trp	Gly	Leu			
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Ala	Arg	Val	Ala	Ala	Leu	Glu	His	Pro	Ala	Ala	Trp	Gly	Gly	Leu	Val					Ala	Arg	Val	Ala	Ala	Leu	Glu	His	Pro	Ala	Ala	Trp	Gly	Gly	Leu	Val				Ala	Arg	Val	Ala	Ala	Leu	Glu	His	Pro	Ala	Ala	Trp	Gly	Gly	Leu	Val			
				1075				1080							1085									1075				1080				1085									1075				1080					1085							
Asp	Leu	Asp	Pro	Gln	Lys	Ser	Pro	Thr	Glu	Ile	Glu	Pro	Leu	Val	Ala					Asp	Leu	Asp	Pro	Gln	Lys	Ser	Pro	Thr	Glu	Ile	Glu	Pro	Leu	Val	Ala				Asp	Leu	Asp	Pro	Gln	Lys	Ser	Pro	Thr	Glu	Ile	Glu	Pro	Leu	Val	Ala			
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Arg	Arg	His	Ala	Ala	Arg	Leu	Val	Ala	Ala	Pro	Pro	Glu	Gly	Asp	Val					Arg	Arg	His	Ala	Ala	Arg	Leu	Val	Ala	Ala	Pro	Pro	Glu	Gly	Asp	Val				Arg	Arg	His	Ala	Ala	Arg	Leu	Val	Ala	Ala	Pro	Pro	Glu	Gly	Asp	Val			
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				1155				1160						1165										1155				1160				1165									1155				1160					1165							
Ala	Arg	His	Leu	Val	Leu	Thr	Ser	Arg	His	Gly	Leu	Pro	Glu	Arg	Gln					Ala	Arg	His	Leu	Val	Leu	Thr	Ser	Arg	His	Gly	Leu	Pro	Glu	Arg	Gln				Ala	Arg	His	Leu	Val	Leu	Thr	Ser	Arg	His	Gly	Leu	Pro	Glu	Arg	Gln			
				1170				1175						1180										1170				1175				1180									1170				1175					1180							
Ala	Ser	Gly	Gly	Glu	Gln	Pro	Pro	Glu	Ala	Arg	Ala	Arg	Ile	Ala	Ala					Ala	Ser	Gly	Gly	Glu	Gln	Pro	Pro	Glu	Ala	Arg	Ala	Arg	Ile	Ala	Ala				Ala	Ser	Gly	Gly	Glu	Gln	Pro	Pro	Glu	Ala	Arg	Ala	Arg	Ile	Ala	Ala			
				1185			1190			1195					1200									1185				1190			1195			1200								1185				1190			1195			1200					
Val	Glu	Gly	Leu	Glu	Ala	Gln	Gly	Ala	Arg	Val	Thr	Val	Ala	Ala	Val					Val	Glu	Gly	Leu	Glu	Ala	Gln	Gly	Ala	Arg	Val	Thr	Val	Ala	Ala	Val				Val	Glu	Gly	Leu	Glu	Ala	Gln	Gly	Ala	Arg	Val	Thr	Val	Ala	Ala	Val			
				1205					1210						1215									1205					1210				1215								1205					1210					1215						
Asp	Val	Ala	Glu	Ala	Asp	Pro	Met	Thr	Ala	Leu	Leu	Ala	Ala	Ile	Glu					Asp	Val	Ala	Glu	Ala	Asp	Pro	Met	Thr	Ala	Leu	Leu	Ala	Ala	Ile	Glu				Asp	Val	Ala	Glu	Ala	Asp	Pro	Met	Thr	Ala	Leu	Leu	Ala	Ala	Ile	Glu			
				1220				1225						1230										1220				1225				1230									1220				1225					1230							
Pro	Pro	Leu	Arg	Gly	Val	Val	His	Ala	Ala	Gly	Val	Phe	Pro	Val	Arg					Pro	Pro	Leu	Arg	Gly	Val	Val	His	Ala	Ala	Gly	Val	Phe	Pro	Val	Arg				Pro	Pro	Leu	Arg	Gly	Val	Val	His	Ala	Ala	Gly	Val	Phe	Pro	Val	Arg			
				1235				1240					1245											1235				1240				1245									1235				1240					1245							
His	Leu	Ala	Glu	Thr	Asp	Glu	Ala	Leu	Leu	Glu	Ser	Val	Leu	Arg	Pro					His	Leu	Ala	Glu	Thr	Asp	Glu	Ala	Leu	Leu	Glu	Ser	Val	Leu	Arg	Pro				His	Leu	Ala	Glu	Thr	Asp	Glu	Ala	Leu	Leu	Glu	Ser	Val	Leu	Arg	Pro			
				1250				1255					1260											1250				1255				1260									1250				1255					1260							
Lys	Val	Ala	Gly	Ser	Trp	Leu	Leu	His	Arg	Leu	Leu	Arg	Asp	Arg	Pro					Lys	Val	Ala	Gly	Ser	Trp	Leu	Leu	His	Arg	Leu	Leu	Arg	Asp	Arg	Pro				Lys	Val	Ala	Gly	Ser	Trp	Leu	Leu	His	Arg	Leu	Leu	Arg	Asp	Arg	Pro			
				1265			1270			1275				1280										1265				1270			1275			1280								1265				1270			1275			1280					
Leu	Asp	Leu	Phe	Val	Leu	Phe	Ser	Ser	Gly	Ala	Ala	Val	Trp	Gly	Gly					Leu	Asp	Leu	Phe	Val	Leu	Phe	Ser	Ser	Gly	Ala	Ala	Val	Trp	Gly	Gly				Leu	Asp	Leu	Phe	Val	Leu	Phe												

1315	1320	1325
Gly Leu Trp Ala Glu Gly Gly Met Val Asp Ala Lys Ala His Ala Arg 1330 1335 1340		
Leu Ser Asp Ile Gly Val Leu Pro Met Ala Thr Gly Pro Ala Leu Ser 1345 1350 1355 1360		
Ala Leu Glu Arg Leu Val Asn Thr Ser Ala Val Gln Arg Ser Val Thr 1365 1370 1375		
Arg Met Asp Trp Ala Arg Phe Ala Pro Val Tyr Ala Ala Arg Gly Arg 1380 1385 1390		
Arg Asn Leu Leu Ser Ala Leu Val Ala Glu Asp Glu Arg Ala Ala Ser 1395 1400 1405		
Pro Pro Val Pro Thr Ala Asn Arg Ile Trp Arg Gly Leu Ser Val Ala 1410 1415 1420		
Glu Ser Arg Ser Ala Leu Tyr Glu Leu Val Arg Gly Ile Val Ala Arg 1425 1430 1435 1440		
Val Leu Gly Phe Ser Asp Pro Gly Ala Leu Asp Val Gly Arg Gly Phe 1445 1450 1455		
Ala Glu Gln Gly Leu Asp Ser Leu Met Ala Leu Glu Ile Arg Asn Arg 1460 1465 1470		
Leu Gln Arg Glu Leu Gly Glu Arg Leu Ser Ala Thr Leu Ala Phe Asp 1475 1480 1485		
His Pro Thr Val Glu Arg Leu Val Ala His Leu Leu Thr Asp Val Leu 1490 1495 1500		
Lys Leu Glu Asp Arg Ser Asp Thr Arg His Ile Arg Ser Val Ala Ala 1505 1510 1515 1520		
Asp Asp Asp Ile Ala Ile Val Gly Ala Ala Cys Arg Phe Pro Gly Gly 1525 1530 1535		
Asp Glu Gly Leu Glu Thr Tyr Trp Arg His Leu Ala Glu Gly Met Val 1540 1545 1550		
Val Ser Thr Glu Val Pro Ala Asp Arg Trp Arg Ala Ala Asp Trp Tyr 1555 1560 1565		
Asp Pro Asp Pro Glu Val Pro Gly Arg Thr Tyr Val Ala Lys Gly Ala 1570 1575 1580		
Phe Leu Arg Asp Val Arg Ser Leu Asp Ala Ala Phe Phe Ala Ile Ser 1585 1590 1595 1600		
Pro Arg Glu Ala Met Ser Leu Asp Pro Gln Gln Arg Leu Leu Leu Glu 1605 1610 1615		
Val Ser Trp Glu Ala Ile Glu Arg Ala Gly Gln Asp Pro Met Ala Leu 1620 1625 1630		
Arg Glu Ser Ala Thr Gly Val Phe Val Gly Met Ile Gly Ser Glu His 1635 1640 1645		
Ala Glu Arg Val Gln Gly Leu Asp Asp Asp Ala Ala Leu Leu Tyr Gly 1650 1655 1660		
Thr Thr Gly Asn Leu Leu Ser Val Ala Ala Gly Arg Leu Ser Phe Phe		

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1665	1670	1675	1680
Leu Gly Leu His Gly	Pro Thr Met Thr Val Asp Thr Ala Cys Ser Ser		
1685	1690	1695	
Ser Leu Val Ala Leu His Leu Ala Cys Gln Ser Leu Arg Leu Gly Glu			
1700	1705	1710	
Cys Asp Gln Ala Leu Ala Gly Gly Ser Ser Val Leu Leu Ser Pro Arg			
1715	1720	1725	
Ser Phe Val Ala Ala Ser Arg Met Arg Leu Leu Ser Pro Asp Gly Arg			
1730	1735	1740	
Cys Lys Thr Phe Ser Ala Ala Ala Asp Gly Phe Ala Arg Ala Glu Gly			
1745	1750	1755	1760
Cys Ala Val Val Val Leu Lys Arg Leu Arg Asp Ala Gln Arg Asp Arg			
1765	1770	1775	
Asp Pro Ile Leu Ala Val Val Arg Ser Thr Ala Ile Asn His Asp Gly			
1780	1785	1790	
Pro Ser Ser Gly Leu Thr Val Pro Ser Gly Pro Ala Gln Ala Leu			
1795	1800	1805	
Leu Arg Gln Ala Leu Ala Gln Ala Gly Val Ala Pro Ala Glu Val Asp			
1810	1815	1820	
Phe Val Glu Cys His Gly Thr Gly Thr Ala Leu Gly Asp Pro Ile Glu			
1825	1830	1835	1840
Val Gln Ala Leu Gly Ala Val Tyr Gly Arg Gly Pro Ala Glu Arg			
1845	1850	1855	
Pro Leu Trp Leu Gly Ala Val Lys Ala Asn Leu Gly His Leu Glu Ala			
1860	1865	1870	
Ala Ala Gly Leu Ala Gly Val Leu Lys Val Leu Leu Ala Leu Glu His			
1875	1880	1885	
Glu Gln Ile Pro Ala Gln Pro Glu Leu Asp Glu Leu Asn Pro His Ile			
1890	1895	1900	
Pro Trp Ala Glu Leu Pro Val Ala Val Val Arg Arg Ala Val Pro Trp			
1905	1910	1915	1920
Pro Arg Gly Ala Arg Pro Arg Arg Ala Gly Val Ser Ala Phe Gly Leu			
1925	1930	1935	
Ser Gly Thr Asn Ala His Val Val Leu Glu Glu Ala Pro Ala Val Glu			
1940	1945	1950	
Pro Val Ala Ala Pro Glu Arg Ala Ala Glu Leu Phe Val Leu Ser			
1955	1960	1965	
Ala Lys Ser Ala Ala Ala Leu Asp Ala Gln Ala Ala Arg Leu Arg Asp			
1970	1975	1980	
His Leu Glu Lys His Val Glu Leu Gly Leu Gly Asp Val Ala Phe Ser			
1985	1990	1995	2000
Leu Ala Thr Thr Arg Ser Ala Met Glu His Arg Leu Ala Val Ala Ala			
2005	2010	2015	
Ser Ser Arg Glu Ala Leu Arg Gly Ala Leu Ser Ala Ala Ala Gln Gly			

2020										2025										2030																											
His	Thr	Pro	Pro	Gly	Ala	Val	Arg	Gly	Arg	Ala	Ser	Gly	Gly	Ser	Ala	His	Thr	Pro	Pro	Gly	Ala	Val	Arg	Gly	Arg	Ala	Ser	Gly	Gly	Ser	Ala	His	Thr	Pro	Pro	Gly	Ala	Val	Arg	Gly	Arg	Ala	Ser	Gly	Gly	Ser	Ala
2035										2040										2045																											
Pro	Lys	Val	Val	Phe	Val	Phe	Pro	Gly	Gln	Gly	Ser	Gln	Trp	Val	Gly	Pro	Lys	Val	Val	Phe	Val	Phe	Pro	Gly	Gln	Gly	Ser	Gln	Trp	Val	Gly	Pro	Lys	Val	Val	Phe	Val	Phe	Pro	Gly	Gln	Gly	Ser	Gln	Trp	Val	Gly
2050										2055										2060																											
Met	Gly	Arg	Lys	Leu	Met	Ala	Glu	Glu	Pro	Val	Phe	Arg	Ala	Ala	Leu	Met	Gly	Arg	Lys	Leu	Met	Ala	Glu	Glu	Pro	Val	Phe	Arg	Ala	Ala	Leu	Met	Gly	Arg	Lys	Leu	Met	Ala	Glu	Glu	Pro	Val	Phe	Arg	Ala	Ala	Leu
2065										2070										2075																											
Glu	Gly	Cys	Asp	Arg	Ala	Ile	Glu	Ala	Glu	Ala	Gly	Trp	Ser	Leu	Leu	Glu	Gly	Cys	Asp	Arg	Ala	Ile	Glu	Ala	Glu	Ala	Gly	Trp	Ser	Leu	Leu	Glu	Gly	Cys	Asp	Arg	Ala	Ile	Glu	Ala	Glu	Ala	Gly	Trp	Ser	Leu	Leu
2085										2090										2095																											
Gly	Glu	Leu	Ser	Ala	Asp	Glu	Ala	Ala	Ser	Gln	Leu	Gly	Arg	Ile	Asp	Gly	Glu	Leu	Ser	Ala	Asp	Glu	Ala	Ala	Ser	Gln	Leu	Gly	Arg	Ile	Asp	Gly	Glu	Leu	Ser	Ala	Asp	Glu	Ala	Ala	Ser	Gln	Leu	Gly	Arg	Ile	Asp
2100										2105										2110																											
Val	Val	Gln	Pro	Val	Leu	Phe	Ala	Met	Glu	Val	Ala	Leu	Ser	Ala	Leu	Val	Val	Gln	Pro	Val	Leu	Phe	Ala	Met	Glu	Val	Ala	Leu	Ser	Ala	Leu	Val	Val	Gln	Pro	Val	Leu	Phe	Ala	Met	Glu	Val	Ala	Leu	Ser	Ala	Leu
2115										2120										2125																											
Trp	Arg	Ser	Trp	Gly	Val	Glu	Pro	Glu	Ala	Val	Val	Gly	His	Ser	Met	Trp	Arg	Ser	Trp	Gly	Val	Glu	Pro	Glu	Ala	Val	Val	Gly	His	Ser	Met	Trp	Arg	Ser	Trp	Gly	Val	Glu	Pro	Glu	Ala	Val	Val	Gly	His	Ser	Met
2130										2135										2140																											
Gly	Glu	Val	Ala	Ala	Ala	His	Val	Ala	Gly	Ala	Leu	Ser	Leu	Glu	Asp	Gly	Glu	Val	Ala	Ala	Ala	His	Val	Ala	Gly	Ala	Leu	Ser	Leu	Glu	Asp	Gly	Glu	Val	Ala	Ala	Ala	His	Val	Ala	Gly	Ala	Leu	Ser	Leu	Glu	Asp
2145										2150										2155																											
Ala	Val	Ala	Ile	Ile	Cys	Arg	Arg	Ser	Arg	Leu	Leu	Arg	Arg	Ile	Ser	Ala	Val	Ala	Ile	Ile	Cys	Arg	Arg	Ser	Arg	Leu	Leu	Arg	Arg	Ile	Ser	Ala	Val	Ala	Ile	Ile	Cys	Arg	Arg	Ser	Arg	Leu	Leu	Arg	Arg	Ile	Ser
2165										2170										2175																											
Gly	Gln	Gly	Glu	Met	Ala	Leu	Val	Glu	Leu	Ser	Leu	Glu	Glu	Ala	Glu	Gly	Gln	Gly	Glu	Met	Ala	Leu	Val	Glu	Leu	Ser	Leu	Glu	Glu	Ala	Glu	Gly	Gln	Gly	Glu	Met	Ala	Leu	Val	Glu	Leu	Ser	Leu	Glu	Glu	Ala	Glu
2180										2185										2190																											
Ala	Ala	Leu	Arg	Gly	His	Glu	Gly	Arg	Leu	Ser	Val	Ala	Val	Ser	Asn	Ala	Ala	Leu	Arg	Gly	His	Glu	Gly	Arg	Leu	Ser	Val	Ala	Val	Ser	Asn	Ala	Ala	Leu	Arg	Gly	His	Glu	Gly	Arg	Leu	Ser	Val	Ala	Val	Ser	Asn
2195										2200										2205																											
Ser	Pro	Arg	Ser	Thr	Val	Leu	Al																																								

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						2370							2375							2380
Pro Leu	Pro Thr	Tyr	Pro Trp	Gln His	Glu Arg	Tyr Trp	Ile Glu Asp													
2385			2390		2395		2400													
Ser Val	His Gly	Ser Lys	Pro Ser	Leu Arg	Leu Arg	Gln Leu	Arg Asn													
		2405			2410		2415													
Gly Ala	Thr Asp	His Pro	Leu Leu	Gly Ala	Pro Leu	Leu Val	Ser Ala													
	2420			2425		2430														
Arg Pro	Gly Ala	His Leu	Trp Glu	Gln Ala	Leu Ser	Asp Glu	Arg Leu													
	2435		2440			2445														
Ser Tyr	Leu Ser	Glu His	Arg Val	His Gly	Glu Ala	Val Leu	Pro Ser													
	2450		2455			2460														
Ala Ala	Tyr Val	Glu Met	Ala Leu	Ala Ala	Gly Val	Asp Leu	Tyr Gly													
2465		2470			2475		2480													
Thr Ala	Thr Leu	Val Leu	Glu Gln	Leu Ala	Leu Glu	Arg Ala	Leu Ala													
		2485			2490		2495													
Val Pro	Ser Glu	Gly Gly	Arg Ile	Val Gln	Val Ala	Leu Ser	Glu Glu													
	2500			2505		2510														
Gly Pro	Gly Arg	Ala Ser	Phe Gln	Val Ser	Ser Arg	Glu Glu	Ala Gly													
	2515		2520			2525														
Arg Ser	Trp Val	Arg His	Ala Thr	Gly His	Val Cys	Ser Gly	Gln Ser													
	2530		2535			2540														
Ser Ala	Val Gly	Ala Leu	Lys Glu	Ala Pro	Trp Glu	Ile Gln	Arg Arg													
2545		2550			2555		2560													
Cys Pro	Ser Val	Leu Ser	Ser Glu	Ala Leu	Tyr Pro	Leu Leu	Asn Glu													
		2565			2570		2575													
His Ala	Leu Asp	Tyr Gly	Pro Cys	Phe Gln	Gly Val	Glu Gln	Val Trp													
	2580			2585		2590														
Leu Gly	Thr Gly	Glu Val	Leu Gly	Arg Val	Arg Leu	Pro Gly	Asp Met													
	2595		2600			2605														
Ala Ser	Ser Ser	Gly Ala	Tyr Arg	Ile His	Pro Ala	Leu Leu	Asp Ala													
	2610		2615			2620														
Cys Phe	Gln Val	Leu Thr	Ala Leu	Leu Thr	Thr Pro	Glu Ser	Ile Glu													
2625		2630			2635		2640													
Ile Arg	Arg Arg	Leu Thr	Asp Leu	His Glu	Pro Asp	Leu Pro	Arg Ser													
		2645		2650			2655													
Arg Ala	Pro Val	Asn Gln	Ala Val	Ser Asp	Thr Trp	Leu Trp	Asp Ala													
	2660			2665		2670														
Ala Leu	Asp Gly	Gly Arg	Arg Gln	Ser Ala	Ser Val	Pro Val	Asp Leu													
	2675		2680			2685														
Val Leu	Gly Ser	Phe His	Ala Lys	Trp Glu	Val Met	Glu Arg	Leu Ala													
	2690		2695			2700														
Gln Ala	Tyr Ile	Ile Gly	Thr Leu	Arg Ile	Trp Asn	Val Phe	Cys Ala													
2705		2710			2715		2720													
Ala Gly	Glu Arg	His Thr	Ile Asp	Glu Leu	Leu Val	Arg Leu	Gln Ile													

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2725	2730	2735
Ser Val Val Tyr Arg Lys Val Ile Lys Arg Trp Met Glu His Leu Val 2740 2745 2750		
Ala Ile Gly Ile Leu Val Gly Asp Gly Glu His Phe Val Ser Ser Gln 2755 2760 2765		
Pro Leu Pro Glu Pro Asp Leu Ala Ala Val Leu Glu Glu Ala Gly Arg 2770 2775 2780		
Val Phe Ala Asp Leu Pro Val Leu Phe Glu Trp Cys Lys Phe Ala Gly 2785 2790 2795 2800		
Glu Arg Leu Ala Asp Val Leu Thr Gly Lys Thr Leu Ala Leu Glu Ile 2805 2810 2815		
Leu Phe Pro Gly Ser Phe Asp Met Ala Glu Arg Ile Tyr Arg Asp 2820 2825 2830		
Ser Pro Ile Ala Arg Tyr Ser Asn Gly Ile Val Arg Gly Val Val Glu 2835 2840 2845		
Ser Ala Ala Arg Val Val Ala Pro Ser Gly Met Phe Ser Ile Leu Glu 2850 2855 2860		
Ile Gly Ala Gly Thr Gly Ala Thr Thr Ala Ala Val Leu Pro Val Leu 2865 2870 2875 2880		
Leu Pro Asp Arg Thr Glu Tyr His Phe Thr Asp Val Ser Pro Leu Phe 2885 2890 2895		
Leu Ala Arg Ala Glu Gln Arg Phe Arg Asp Tyr Pro Phe Leu Lys Tyr 2900 2905 2910		
Gly Ile Leu Asp Val Asp Gln Glu Pro Ala Gly Gln Gly Tyr Ala His 2915 2920 2925		
Gln Arg Phe Asp Val Ile Val Ala Ala Asn Val Ile His Ala Thr Arg 2930 2935 2940		
Asp Ile Arg Ala Thr Ala Lys Arg Leu Leu Ser Leu Leu Ala Pro Gly 2945 2950 2955 2960		
Gly Leu Leu Val Leu Val Glu Gly Thr Gly His Pro Ile Trp Phe Asp 2965 2970 2975		
Ile Thr Thr Gly Leu Ile Glu Gly Trp Gln Lys Tyr Glu Asp Asp Leu 2980 2985 2990		
Arg Ile Asp His Pro Leu Leu Pro Ala Arg Thr Trp Cys Asp Val Leu 2995 3000 3005		
Arg Arg Val Gly Phe Ala Asp Ala Val Ser Leu Pro Gly Asp Gly Ser 3010 3015 3020		
Pro Ala Gly Ile Leu Gly Gln His Val Ile Leu Ser Arg Ala Pro Gly 3025 3030 3035 3040		
Ile Ala Gly Ala Ala Cys Asp Ser Ser Gly Glu Ser Ala Thr Glu Ser 3045 3050 3055		
Pro Ala Ala Arg Ala Val Arg Gln Glu Trp Ala Asp Gly Ser Ala Asp 3060 3065 3070		
Val Val His Arg Met Ala Leu Glu Arg Met Tyr Phe His Arg Arg Pro		

3075	3080	3085
Gly Arg Gln Val Trp Val His Gly Arg Leu Arg Thr Gly Gly Gly Ala 3090 3095 3100		
Phe Thr Lys Ala Leu Ala Gly Asp Leu Leu Leu Phe Glu Asp Thr Gly 3105 3110 3115 3120		
Gln Val Val Ala Glu Val Gln Gly Leu Arg Leu Pro Gln Leu Glu Ala 3125 3130 3135		
Ser Ala Phe Ala Pro Arg Asp Pro Arg Glu Glu Trp Leu Tyr Ala Leu 3140 3145 3150		
Glu Trp Gln Arg Lys Asp Pro Ile Pro Glu Ala Pro Ala Ala Ala Ser 3155 3160 3165		
Ser Ser Ser Ala Gly Ala Trp Leu Val Leu Met Asp Gln Gly Gly Thr 3170 3175 3180		
Gly Ala Ala Leu Val Ser Leu Leu Glu Gly Arg Gly Glu Ala Cys Val 3185 3190 3195 3200		
Arg Val Ile Ala Gly Thr Ala Tyr Ala Cys Leu Ala Pro Gly Leu Tyr 3205 3210 3215		
Gln Val Asp Pro Ala Gln Pro Asp Gly Phe His Thr Leu Leu Arg Asp 3220 3225 3230		
Ala Phe Gly Glu Asp Arg Ile Cys Arg Ala Val Val His Met Trp Ser 3235 3240 3245		
Leu Asp Ala Thr Ala Ala Gly Glu Arg Ala Thr Ala Glu Ser Leu Gln 3250 3255 3260		
Ala Asp Gln Leu Leu Gly Ser Leu Ser Ala Leu Ser Leu Val Gln Ala 3265 3270 3275 3280		
Leu Val Arg Arg Trp Arg Asn Met Pro Arg Leu Trp Leu Leu Thr 3285 3290 3295		
Arg Ala Val His Ala Val Gly Ala Glu Asp Ala Ala Ala Ser Val Ala 3300 3305 3310		
Gln Ala Pro Val Trp Gly Leu Gly Arg Thr Leu Ala Leu Glu His Pro 3315 3320 3325		
Glu Leu Arg Cys Thr Leu Val Asp Val Asn Pro Ala Pro Ser Pro Glu 3330 3335 3340		
Asp Ala Ala Ala Leu Ala Val Glu Leu Gly Ala Ser Asp Arg Glu Asp 3345 3350 3355 3360		
Gln Val Ala Leu Arg Ser Asp Gly Arg Tyr Val Ala Arg Leu Val Arg 3365 3370 3375		
Ser Ser Phe Ser Gly Lys Pro Ala Thr Asp Cys Gly Ile Arg Ala Asp 3380 3385 3390		
Gly Ser Tyr Val Ile Thr Asp Gly Met Gly Arg Val Gly Leu Ser Val 3395 3400 3405		
Ala Gln Trp Met Val Met Gln Gly Ala Arg His Val Val Leu Val Asp 3410 3415 3420		
Arg Gly Gly Ala Ser Glu Ala Ser Arg Asp Ala Leu Arg Ser Met Ala		

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3425	3430	3435	3440
Glu Ala Gly	Ala Glu Val Gln Ile Val	Glu Ala Asp Val	Ala Arg Arg
	3445	3450	3455
Asp Asp Val	Ala Arg Leu Leu Ser Lys	Ile Glu Pro Ser Met	Pro Pro
	3460	3465	3470
Leu Arg Gly	Ile Val Tyr Val Asp Gly Thr Phe	Gln Gly Asp Ser	Ser
	3475	3480	3485
Met Leu Glu	Leu Asp Ala Arg Arg Phe Lys	Glu Trp Met Tyr	Pro Lys
	3490	3495	3500
Val Leu Gly	Ala Trp Asn Leu His Ala Leu Thr	Arg Asp Arg Ser	Leu
	3505	3510	3515
Asp Phe Phe	Val Leu Tyr Ser Ser Gly Thr Ser	Leu Leu Gly Leu	Pro
	3525	3530	3535
Gly Gln Gly	Ser Arg Ala Ala Gly Asp Ala Phe	Leu Asp Ala Ile	Ala
	3540	3545	3550
His His Arg	Cys Lys Val Gly Leu Thr Ala Met Ser	Ile Asn Trp Gly	
	3555	3560	3565
Leu Leu Ser	Glu Ala Ser Ser Pro Ala Thr	Pro Asn Asp Gly Gly	Ala
	3570	3575	3580
Arg Leu Glu	Tyr Arg Gly Met Glu Gly Leu Thr	Leu Glu Gln Gly	Ala
	3585	3590	3595
Ala Ala Leu	Gly Arg Leu Leu Ala Arg Pro Arg	Ala Gln Val Gly	Val
	3605	3610	3615
Met Arg Leu	Asn Leu Arg Gln Trp Leu Glu Phe Tyr	Pro Asn Ala Ala	
	3620	3625	3630
Arg Leu Ala	Leu Trp Ala Glu Leu Lys Glu Arg Asp	Arg Ala Asp	
	3635	3640	3645
Arg Gly Ala	Ser Asn Ala Ser Asn Leu Arg Glu Ala	Leu Gln Ser Ala	
	3650	3655	3660
Arg Pro Glu	Asp Arg Gln Leu Ile Leu Glu Lys His	Leu Ser Glu Leu	
	3665	3670	3675
Leu Gly Arg	Gly Leu Arg Leu Pro Pro Glu Arg Ile	Glu Arg His Val	
	3685	3690	3695
Pro Phe Ser	Asn Leu Gly Met Asp Ser Leu Ile Gly	Leu Glu Leu Arg	
	3700	3705	3710
Asn Arg Ile	Glu Ala Ala Leu Gly Ile Thr Val Pro	Ala Thr Leu Leu	
	3715	3720	3725
Trp Thr Tyr	Pro Asn Val Ala Ala Leu Ser Gly Ser	Leu Leu Asp Ile	
	3730	3735	3740
Leu Phe Pro	Asn Ala Gly Ala Thr His Ala Pro Ala	Thr Glu Arg Glu	
	3745	3750	3755
Lys Ser Phe	Glu Asn Asp Ala Ala Asp Leu Glu Ala	Leu Arg Gly Met	
	3765	3770	3775
Thr Asp Glu	Gln Lys Asp Ala Leu Leu Ala Glu Lys	Leu Ala Gln Leu	

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3780

3785

3790

Ala Gln Ile Val Gly Glu
3795

<210> 7

<211> 2439

<212> PRT

<213> Sorangium cellulosum

<400> 7

Met Ala Thr Thr Asn Ala Gly Lys Leu Glu His Ala Leu Leu Leu Met
1 5 10 15

Asp Lys Leu Ala Lys Lys Asn Ala Ser Leu Glu Gln Glu Arg Thr Glu
20 25 30

Pro Ile Ala Ile Val Gly Ile Gly Cys Arg Phe Pro Gly Gly Ala Asp
35 40 45

Thr Pro Glu Ala Phe Trp Glu Leu Leu Asp Ser Gly Arg Asp Ala Val
50 55 60

Gln Pro Leu Asp Arg Arg Trp Ala Leu Val Gly Val His Pro Ser Glu
65 70 75 80

Glu Val Pro Arg Trp Ala Gly Leu Leu Thr Glu Ala Val Asp Gly Phe
85 90 95

Asp Ala Ala Phe Phe Gly Thr Ser Pro Arg Glu Ala Arg Ser Leu Asp
100 105 110

Pro Gln Gln Arg Leu Leu Leu Glu Val Thr Trp Glu Gly Leu Glu Asp
115 120 125

Ala Gly Ile Ala Pro Gln Ser Leu Asp Gly Ser Arg Thr Gly Val Phe
130 135 140

Leu Gly Ala Cys Ser Ser Asp Tyr Ser His Thr Val Ala Gln Gln Arg
145 150 155 160

Arg Glu Glu Gln Asp Ala Tyr Asp Ile Thr Gly Asn Thr Leu Ser Val
165 170 175

Ala Ala Gly Arg Leu Ser Tyr Thr Leu Gly Leu Gln Gly Pro Cys Leu
180 185 190

Thr Val Asp Thr Ala Cys Ser Ser Ser Leu Val Ala Ile His Leu Ala
195 200 205

Cys Arg Ser Leu Arg Ala Arg Glu Ser Asp Leu Ala Leu Ala Gly Gly
210 215 220

Val Asn Met Leu Leu Ser Ser Lys Thr Met Ile Met Leu Gly Arg Ile
225 230 235 240

Gln Ala Leu Ser Pro Asp Gly His Cys Arg Thr Phe Asp Ala Ser Ala
245 250 255

Asn Gly Phe Val Arg Gly Glu Gly Cys Gly Met Val Val Leu Lys Arg
260 265 270

Leu Ser Asp Ala Gln Arg His Gly Asp Arg Ile Trp Ala Leu Ile Arg
275 280 285

Gly Ser Ala Met Asn Gln Asp Gly Arg Ser Thr Gly Leu Met Ala Pro
290 295 300

Asn Val Leu Ala Gln Glu Ala Leu Leu Arg Glu Ala Leu Gln Ser Ala
305 310 315 320

Arg Val Asp Ala Gly Ala Ile Gly Tyr Val Glu Thr His Gly Thr Gly
325 330 335

Thr Ser Leu Gly Asp Pro Ile Glu Val Glu Ala Leu Arg Ala Val Leu
340 345 350

Gly Pro Ala Arg Ala Asp Gly Ser Arg Cys Val Leu Gly Ala Val Lys
355 360 365

Thr Asn Leu Gly His Leu Glu Gly Ala Ala Gly Val Ala Gly Leu Ile
370 375 380

Lys Ala Ala Leu Ala Leu His His Glu Leu Ile Pro Arg Asn Leu His
385 390 395 400

Phe His Thr Leu Asn Pro Arg Ile Arg Ile Glu Gly Thr Ala Leu Ala
405 410 415

Leu Ala Thr Glu Pro Val Pro Trp Pro Arg Ala Gly Arg Pro Arg Phe
420 425 430

Ala Gly Val Ser Ala Phe Gly Leu Ser Gly Thr Asn Val His Val Val
435 440 445

Leu Glu Glu Ala Pro Ala Thr Val Leu Ala Pro Ala Thr Pro Gly Arg
450 455 460

Ser Ala Glu Leu Leu Val Leu Ser Ala Lys Ser Ala Ala Ala Leu Asp
465 470 475 480

Ala Gln Ala Ala Arg Leu Ser Ala His Ile Ala Ala Tyr Pro Glu Gln
485 490 495

Gly Leu Gly Asp Val Ala Phe Ser Leu Val Ser Thr Arg Ser Pro Met
500 505 510

Glu His Arg Leu Ala Val Ala Ala Thr Ser Arg Glu Ala Leu Arg Ser
515 520 525

Ala Leu Glu Val Ala Ala Gln Gly Gln Thr Pro Ala Gly Ala Ala Arg
530 535 540

Gly Arg Ala Ala Ser Ser Pro Gly Lys Leu Ala Phe Leu Phe Ala Gly
545 550 555 560

Gln Gly Ala Gln Val Pro Gly Met Gly Arg Gly Leu Trp Glu Ala Trp
565 570 575

Pro Ala Phe Arg Glu Thr Phe Asp Arg Cys Val Thr Leu Phe Asp Arg
580 585 590

Glu Leu His Gln Pro Leu Cys Glu Val Met Trp Ala Glu Pro Gly Ser
595 600 605

Ser Arg Ser Ser Leu Leu Asp Gln Thr Ala Phe Thr Gln Pro Ala Leu
610 615 620

Phe Ala Leu Glu Tyr Ala Leu Ala Ala Leu Phe Arg Ser Trp Gly Val
625 630 635 640

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Glu Pro Glu Leu Val Ala Gly His Ser Leu Gly Glu Leu Val Ala Ala
 645 650 655
 Cys Val Ala Gly Val Phe Ser Leu Glu Asp Ala Val Arg Leu Val Val
 660 665 670
 Ala Arg Gly Arg Leu Met Gln Ala Leu Pro Ala Gly Gly Ala Met Val
 675 680 685
 Ser Ile Ala Ala Pro Glu Ala Asp Val Ala Ala Val Ala Pro His
 690 695 700
 Ala Ala Leu Val Ser Ile Ala Ala Val Asn Gly Pro Glu Gln Val Val
 705 710 715 720
 Ile Ala Gly Ala Glu Lys Phe Val Gln Gln Ile Ala Ala Phe Ala
 725 730 735
 Ala Arg Gly Ala Arg Thr Lys Pro Leu His Val Ser His Ala Phe His
 740 745 750
 Ser Pro Leu Met Asp Pro Met Leu Glu Ala Phe Arg Arg Val Thr Glu
 755 760 765
 Ser Val Thr Tyr Arg Arg Pro Ser Ile Ala Leu Val Ser Asn Leu Ser
 770 775 780
 Gly Lys Pro Cys Thr Asp Glu Val Ser Ala Pro Gly Tyr Trp Val Arg
 785 790 795 800
 His Ala Arg Glu Ala Val Arg Phe Ala Asp Gly Val Lys Ala Leu His
 805 810 815
 Ala Ala Gly Ala Gly Leu Phe Val Glu Val Gly Pro Lys Pro Thr Leu
 820 825 830
 Leu Gly Leu Val Pro Ala Cys Leu Pro Asp Ala Arg Pro Val Leu Leu
 835 840 845
 Pro Ala Ser Arg Ala Gly Arg Asp Glu Ala Ala Ser Ala Leu Glu Ala
 850 855 860
 Leu Gly Gly Phe Trp Val Val Gly Gly Ser Val Thr Trp Ser Gly Val
 865 870 875 880
 Phe Pro Ser Gly Gly Arg Arg Val Pro Leu Pro Thr Tyr Pro Trp Gln
 885 890 895
 Arg Glu Arg Tyr Trp Ile Glu Ala Pro Val Asp Arg Glu Ala Asp Gly
 900 905 910
 Thr Gly Arg Ala Arg Ala Gly Gly His Pro Leu Leu Gly Glu Val Phe
 915 920 925
 Ser Val Ser Thr His Ala Gly Leu Arg Leu Trp Glu Thr Thr Leu Asp
 930 935 940
 Arg Lys Arg Leu Pro Trp Leu Gly Glu His Arg Ala Gln Gly Glu Val
 945 950 955 960
 Val Phe Pro Gly Ala Gly Tyr Leu Glu Met Ala Leu Ser Ser Gly Ala
 965 970 975
 Glu Ile Leu Gly Asp Gly Pro Ile Gln Val Thr Asp Val Val Leu Ile
 980 985 990

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Glu Thr Leu Thr Phe Ala Gly Asp Thr Ala Val Pro Val Gln Val Val
 995 1000 1005
 Thr Thr Glu Glu Arg Pro Gly Arg Leu Arg Phe Gln Val Ala Ser Arg
 1010 1015 1020
 Glu Pro Gly Glu Arg Arg Ala Pro Phe Arg Ile His Ala Arg Gly Val
 1025 1030 1035 1040
 Leu Arg Arg Ile Gly Arg Val Glu Thr Pro Ala Arg Ser Asn Leu Ala
 1045 1050 1055
 Ala Leu Arg Ala Arg Leu His Ala Ala Val Pro Ala Ala Ala Ile Tyr
 1060 1065 1070
 Gly Ala Leu Ala Glu Met Gly Gly Leu Gln Tyr Gly Pro Ala Leu Arg Gly
 1075 1080 1085
 Leu Ala Glu Leu Trp Arg Gly Glu Gly Glu Ala Leu Gly Arg Val Arg
 1090 1095 1100
 Leu Pro Glu Ala Ala Gly Ser Ala Thr Ala Tyr Gln Leu His Pro Val
 1105 1110 1115 1120
 Leu Leu Asp Ala Cys Val Gln Met Ile Val Gly Ala Phe Ala Asp Arg
 1125 1130 1135
 Asp Glu Ala Thr Pro Trp Ala Pro Val Glu Val Gly Ser Val Arg Leu
 1140 1145 1150
 Phe Gln Arg Ser Pro Gly Glu Leu Trp Cys His Ala Arg Val Val Ser
 1155 1160 1165
 Asp Gly Gln Gln Ala Ser Ser Arg Trp Ser Ala Asp Phe Glu Leu Met
 1170 1175 1180
 Asp Gly Thr Gly Ala Val Val Ala Glu Ile Ser Arg Leu Val Val Glu
 1185 1190 1195 1200
 Arg Leu Ala Ser Gly Val Arg Arg Arg Asp Ala Asp Asp Trp Phe Leu
 1205 1210 1215
 Glu Leu Asp Trp Glu Pro Ala Ala Leu Gly Gly Pro Lys Ile Thr Ala
 1220 1225 1230
 Gly Arg Trp Leu Leu Leu Gly Glu Gly Gly Gly Leu Gly Arg Ser Leu
 1235 1240 1245
 Cys Ser Ala Leu Lys Ala Ala Gly His Val Val Val His Ala Ala Gly
 1250 1255 1260
 Asp Asp Thr Ser Thr Ala Gly Met Arg Ala Leu Leu Ala Asn Ala Phe
 1265 1270 1275 1280
 Asp Gly Gln Ala Pro Thr Ala Val Val His Leu Ser Ser Leu Asp Gly
 1285 1290 1295
 Gly Gly Gln Leu Gly Pro Gly Leu Gly Ala Gln Gly Ala Leu Asp Ala
 1300 1305 1310
 Pro Arg Ser Pro Asp Val Asp Ala Asp Ala Leu Glu Ser Ala Leu Met
 1315 1320 1325
 Arg Gly Cys Asp Ser Val Leu Ser Leu Val Gln Ala Leu Val Gly Met
 1330 1335 1340

Asp Leu Arg Asn Ala Pro Arg Leu Trp Leu Leu Thr Arg Gly Ala Gln
 1345 1350 1355 1360
 Ala Ala Ala Ala Gly Asp Val Ser Val Val Gln Ala Pro Leu Leu Gly
 1365 1370 1375
 Leu Gly Arg Thr Ile Ala Leu Glu His Ala Glu Leu Arg Cys Ile Ser
 1380 1385 1390
 Val Asp Leu Asp Pro Ala Glu Pro Glu Gly Glu Ala Asp Ala Leu Leu
 1395 1400 1405
 Ala Glu Leu Leu Ala Asp Asp Ala Glu Glu Glu Val Ala Leu Arg Gly
 1410 1415 1420
 Gly Asp Arg Leu Val Ala Arg Leu Val His Arg Leu Pro Asp Ala Gln
 1425 1430 1435 1440
 Arg Arg Glu Lys Val Glu Pro Ala Gly Asp Arg Pro Phe Arg Leu Glu
 1445 1450 1455
 Ile Asp Glu Pro Gly Ala Leu Asp Gln Leu Val Leu Arg Ala Thr Gly
 1460 1465 1470
 Arg Arg Ala Pro Gly Pro Gly Glu Val Glu Ile Ser Val Glu Ala Ala
 1475 1480 1485
 Gly Leu Asp Ser Ile Asp Ile Gln Leu Ala Leu Gly Val Ala Pro Asn
 1490 1495 1500
 Asp Leu Pro Gly Glu Glu Ile Glu Pro Leu Val Leu Gly Ser Glu Cys
 1505 1510 1515 1520
 Ala Gly Arg Ile Val Ala Val Gly Glu Gly Val Asn Gly Leu Val Val
 1525 1530 1535
 Gly Gln Pro Val Ile Ala Leu Ala Ala Gly Val Phe Ala Thr His Val
 1540 1545 1550
 Thr Thr Ser Ala Thr Leu Val Leu Pro Arg Pro Leu Gly Leu Ser Ala
 1555 1560 1565
 Thr Glu Ala Ala Ala Met Pro Leu Ala Tyr Leu Thr Ala Trp Tyr Ala
 1570 1575 1580
 Leu Asp Lys Val Ala His Leu Gln Ala Gly Glu Arg Val Leu Ile His
 1585 1590 1595 1600
 Ala Glu Ala Gly Gly Val Gly Leu Cys Ala Val Arg Trp Ala Gln Arg
 1605 1610 1615
 Val Gly Ala Glu Val Tyr Ala Thr Ala Asp Thr Pro Glu Asn Arg Ala
 1620 1625 1630
 Tyr Leu Glu Ser Leu Gly Val Arg Tyr Val Ser Asp Ser Arg Ser Gly
 1635 1640 1645
 Arg Phe Val Thr Asp Val His Ala Trp Thr Asp Gly Glu Gly Val Asp
 1650 1655 1660
 Val Val Leu Asp Ser Leu Ser Gly Glu Arg Ile Asp Lys Ser Leu Met
 1665 1670 1675 1680
 Val Leu Arg Ala Cys Gly Arg Leu Val Lys Leu Gly Arg Arg Asp Asp
 1685 1690 1695

Cys Ala Asp Thr Gln Pro Gly Leu Pro Pro Leu Leu Arg Asn Phe Ser
 1700 1705 1710
 Phe Ser Gln Val Asp Leu Arg Gly Met Met Leu Asp Gln Pro Ala Arg
 1715 1720 1725
 Ile Arg Ala Leu Leu Asp Glu Leu Phe Gly Leu Val Ala Ala Gly Ala
 1730 1735 1740
 Ile Ser Pro Leu Gly Ser Gly Leu Arg Val Gly Gly Ser Leu Thr Pro
 1745 1750 1755 1760
 Pro Pro Val Glu Thr Phe Pro Ile Ser Arg Ala Ala Glu Ala Phe Arg
 1765 1770 1775
 Arg Met Ala Gln Gly Gln His Leu Gly Lys Leu Val Leu Thr Leu Asp
 1780 1785 1790
 Asp Pro Glu Val Arg Ile Arg Ala Pro Ala Glu Ser Ser Val Ala Val
 1795 1800 1805
 Arg Ala Asp Gly Thr Tyr Leu Val Thr Gly Gly Leu Gly Gly Leu Gly
 1810 1815 1820
 Leu Arg Val Ala Gly Trp Leu Ala Glu Arg Gly Ala Gly Gln Leu Val
 1825 1830 1835 1840
 Leu Val Gly Arg Ser Gly Ala Ala Ser Ala Glu Gln Arg Ala Ala Val
 1845 1850 1855
 Ala Ala Leu Glu Ala His Gly Ala Arg Val Thr Val Ala Lys Ala Asp
 1860 1865 1870
 Val Ala Asp Arg Ser Gln Ile Glu Arg Val Leu Arg Gly Val Thr Ala
 1875 1880 1885
 Ser Gly Met Pro Leu Arg Gly Val Val His Ala Ala Gly Leu Val Asp
 1890 1895 1900
 Asp Gly Leu Leu Met Gln Gln Thr Pro Ala Arg Phe Arg Thr Val Met
 1905 1910 1915 1920
 Gly Pro Lys Val Gln Gly Ala Leu His Leu His Thr Leu Thr Arg Glu
 1925 1930 1935
 Ala Pro Leu Ser Phe Phe Val Leu Tyr Ala Ser Ala Ala Gly Leu Phe
 1940 1945 1950
 Gly Ser Pro Gly Gln Gly Asn Tyr Ala Ala Ala Asn Ala Phe Leu Asp
 1955 1960 1965
 Ala Leu Ser His His Arg Arg Ala Gln Gly Leu Pro Ala Leu Ser Ile
 1970 1975 1980
 Asp Trp Gly Met Phe Thr Glu Val Gly Met Ala Val Ala Gln Glu Asn
 1985 1990 1995 2000
 Arg Gly Ala Arg Gln Ile Ser Arg Gly Met Arg Gly Ile Thr Pro Asp
 2005 2010 2015
 Glu Gly Leu Ser Ala Leu Ala Arg Leu Leu Glu Gly Asp Arg Val Gln
 2020 2025 2030
 Thr Gly Val Ile Pro Ile Thr Pro Arg Gln Trp Val Glu Phe Tyr Pro
 2035 2040 2045

Ala Thr Ala Ala Ser Arg Arg Leu Ser Arg Leu Val Thr Thr Gln Arg
 2050 2055 2060

Ala Val Ala Asp Arg Thr Ala Gly Asp Arg Asp Leu Leu Glu Gln Leu
 2065 2070 2075 2080

Ala Ser Ala Glu Pro Ser Ala Arg Ala Gly Leu Leu Gln Asp Val Val
 2085 2090 2095

Arg Val Gln Val Ser His Val Leu Arg Leu Pro Glu Asp Lys Ile Glu
 2100 2105 2110

Val Asp Ala Pro Leu Ser Ser Met Gly Met Asp Ser Leu Met Ser Leu
 2115 2120 2125

Glu Leu Arg Asn Arg Ile Glu Ala Ala Leu Gly Val Ala Ala Pro Ala
 2130 2135 2140

Ala Leu Gly Trp Thr Tyr Pro Thr Val Ala Ala Ile Thr Arg Trp Leu
 2145 2150 2155 2160

Leu Asp Asp Ala Leu Val Val Arg Leu Gly Gly Gly Ser Asp Thr Asp
 2165 2170 2175

Glu Ser Thr Ala Ser Ala Gly Ser Phe Val His Val Leu Arg Phe Arg
 2180 2185 2190

Pro Val Val Lys Pro Arg Ala Arg Leu Phe Cys Phe His Gly Ser Gly
 2195 2200 2205

Gly Ser Pro Glu Gly Phe Arg Ser Trp Ser Glu Lys Ser Glu Trp Ser
 2210 2215 2220

Asp Leu Glu Ile Val Ala Met Trp His Asp Arg Ser Leu Ala Ser Glu
 2225 2230 2235 2240

Asp Ala Pro Gly Lys Lys Tyr Val Gln Glu Ala Ala Ser Leu Ile Gln
 2245 2250 2255

His Tyr Ala Asp Ala Pro Phe Ala Leu Val Gly Phe Ser Leu Gly Val
 2260 2265 2270

Arg Phe Val Met Gly Thr Ala Val Glu Leu Ala Ser Arg Ser Gly Ala
 2275 2280 2285

Pro Ala Pro Leu Ala Val Phe Thr Leu Gly Gly Ser Leu Ile Ser Ser
 2290 2295 2300

Ser Glu Ile Thr Pro Glu Met Glu Thr Asp Ile Ile Ala Lys Leu Phe
 2305 2310 2315 2320

Phe Arg Asn Ala Ala Gly Phe Val Arg Ser Thr Gln Gln Val Gln Ala
 2325 2330 2335

Asp Ala Arg Ala Asp Lys Val Ile Thr Asp Thr Met Val Ala Pro Ala
 2340 2345 2350

Pro Gly Asp Ser Lys Glu Pro Pro Val Lys Ile Ala Val Pro Ile Val
 2355 2360 2365

Ala Ile Ala Gly Ser Asp Asp Val Ile Val Pro Pro Ser Asp Val Gln
 2370 2375 2380

Asp Leu Gln Ser Arg Thr Thr Glu Arg Phe Tyr Met His Leu Leu Pro
 2385 2390 2395 2400

Gly Asp His Glu Phe Leu Val Asp Arg Gly Arg Glu Ile Met His Ile
2405 2410 2415

Val Asp Ser His Leu Asn Pro Leu Leu Ala Ala Arg Thr Thr Ser Ser
2420 2425 2430

Gly Pro Ala Phe Glu Ala Lys
2435

<210> 8

<211> 419

<212> PRT

<213> Sorangium cellulosum

<400> 8

Met Thr Gln Glu Gln Ala Asn Gln Ser Glu Thr Lys Pro Ala Phe Asp
1 5 10 15

Phe Lys Pro Phe Ala Pro Gly Tyr Ala Glu Asp Pro Phe Pro Ala Ile
20 25 30

Glu Arg Leu Arg Glu Ala Thr Pro Ile Phe Tyr Trp Asp Glu Gly Arg
35 40 45

Ser Trp Val Leu Thr Arg Tyr His Asp Val Ser Ala Val Phe Arg Asp
50 55 60

Glu Arg Phe Ala Val Ser Arg Glu Glu Trp Glu Ser Ser Ala Glu Tyr
65 70 75 80

Ser Ser Ala Ile Pro Glu Leu Ser Asp Met Lys Lys Tyr Gly Leu Phe
85 90 95

Gly Leu Pro Pro Glu Asp His Ala Arg Val Arg Lys Leu Val Asn Pro
100 105 110

Ser Phe Thr Ser Arg Ala Ile Asp Leu Leu Arg Ala Glu Ile Gln Arg
115 120 125

Thr Val Asp Gln Leu Leu Asp Ala Arg Ser Gly Gln Glu Glu Phe Asp
130 135 140

Val Val Arg Asp Tyr Ala Glu Gly Ile Pro Met Arg Ala Ile Ser Ala
145 150 155 160

Leu Leu Lys Val Pro Ala Glu Cys Asp Glu Lys Phe Arg Arg Phe Gly
165 170 175

Ser Ala Thr Ala Arg Ala Leu Gly Val Gly Leu Val Pro Gln Val Asp
180 185 190

Glu Glu Thr Lys Thr Leu Val Ala Ser Val Thr Glu Gly Leu Ala Leu
195 200 205

Leu His Asp Val Leu Asp Glu Arg Arg Arg Asn Pro Leu Glu Asn Asp
210 215 220

Val Leu Thr Met Leu Leu Gln Ala Glu Ala Asp Gly Ser Arg Leu Ser
225 230 235 240

Thr Lys Glu Leu Val Ala Leu Val Gly Ala Ile Ile Ala Ala Gly Thr
245 250 255

Asp Thr Thr Ile Tyr Leu Ile Ala Phe Ala Val Leu Asn Leu Leu Arg
260 265 270

Ser Pro Glu Ala Leu Glu Leu Val Lys Ala Glu Pro Gly Leu Met Arg
275 280 285

Asn Ala Leu Asp Glu Val Leu Arg Phe Asp Asn Ile Leu Arg Ile Gly
290 295 300

Thr Val Arg Phe Ala Arg Gln Asp Leu Glu Tyr Cys Gly Ala Ser Ile
305 310 315 320

Lys Lys Gly Glu Met Val Phe Leu Leu Ile Pro Ser Ala Leu Arg Asp
325 330 335

Gly Thr Val Phe Ser Arg Pro Asp Val Phe Asp Val Arg Arg Asp Thr
340 345 350

Gly Ala Ser Leu Ala Tyr Gly Arg Gly Pro His Val Cys Pro Gly Val
355 360 365

Ser Leu Ala Arg Leu Glu Ala Glu Ile Ala Val Gly Thr Ile Phe Arg
370 375 380

Arg Phe Pro Glu Met Lys Leu Lys Glu Thr Pro Val Phe Gly Tyr His
385 390 395 400

Pro Ala Phe Arg Asn Ile Glu Ser Leu Asn Val Ile Leu Lys Pro Ser
405 410 415

Lys Ala Gly

<210> 9

<211> 607

<212> PRT

<213> Sorangium cellulosum

<400> 9

Ala Ser Leu Asp Ala Leu Phe Ala Arg Ala Thr Ser Ala Arg Val Leu
1 5 10 15

Asp Asp Gly His Gly Arg Ala Thr Glu Arg His Val Leu Ala Glu Ala
20 25 30

Arg Gly Ile Glu Asp Leu Arg Ala Leu Arg Glu His Leu Arg Ile Gln
35 40 45

Glu Gly Gly Pro Ser Phe His Cys Met Cys Leu Gly Asp Leu Thr Val
50 55 60

Glu Leu Leu Ala His Asp Gln Pro Leu Ala Ser Ile Ser Phe His His
65 70 75 80

Ala Arg Ser Leu Arg His Pro Asp Trp Thr Ser Asp Ala Met Leu Val
85 90 95

Asp Gly Pro Ala Leu Val Arg Trp Leu Ala Ala Arg Gly Ala Pro Gly
100 105 110

Pro Leu Arg Glu Tyr Glu Glu Glu Arg Glu Arg Ala Arg Thr Ala Gln
115 120 125

Glu Ala Arg Arg Leu Trp Leu Ala Ala Ala Pro Pro Cys Phe Ala Pro
130 135 140

Asp Leu Pro Arg Phe Glu Asp Asp Ala Asn Gly Leu Pro Leu Gly Pro

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145		150		155		160
Met Ser Pro Glu Val	Ala Glu Ala Glu Arg	Arg Leu Arg Ala Ser Tyr				
	165	170	175			
Ala Thr Pro Glu Leu	Ala Cys Ala Ala Leu Leu	Ala Trp Leu Gly Thr				
	180	185	190			
Gly Ala Gly Pro Trp Ser	Gly Tyr Pro Ala Tyr Glu Met	Leu Pro Glu				
	195	200	205			
Asn Leu Leu Leu Gly Phe	Gly Leu Pro Thr Ala Ile	Ala Ala Ala Ser				
	210	215	220			
Ala Pro Gly Thr Ser Glu	Ala Ala Leu Arg Gly Ala	Ala Arg Leu Phe				
	225	230	235			240
Ala Ser Trp Glu Val Val	Ser Ser Lys Lys Ser Gln	Leu Gly Asn Ile				
	245	250	255			
Pro Glu Ala Leu Trp Glu	Arg Leu Arg Thr Ile Val	Arg Ala Met Gly				
	260	265	270			
Asn Ala Asp Asn Leu Ser	Arg Phe Glu Arg Ala Glu	Ala Ile Ala Ala				
	275	280	285			
Glu Val Arg Arg Leu Arg	Ala Gln Pro Ala Pro Phe	Ala Ala Gly Ala				
	290	295	300			
Gly Leu Ala Val Ala Gly	Val Ser Ser Ser Gly Arg	Leu Ser Gly Leu				
	305	310	315			320
Val Thr Asp Gly Asp	Ala Leu Tyr Ser Gly Asp	Gly Asn Asp Ile Val				
	325	330	335			
Met Phe Gln Pro Gly Arg	Ile Ser Pro Val Val Leu	Leu Ala Gly Thr				
	340	345	350			
Asp Pro Phe Phe Glu Leu	Ala Pro Pro Leu Ser Gln	Met Leu Phe Val				
	355	360	365			
Ala His Ala Asn Ala Gly	Thr Ile Ser Lys Val Leu	Thr Glu Gly Ser				
	370	375	380			
Pro Leu Ile Val Met Ala	Arg Asn Gln Ala Arg Pro	Met Ser Leu Val				
	385	390	395			400
His Ala Arg Gly Phe	Met Ala Trp Val Asn Gln	Ala Met Val Pro Asp				
	405	410	415			
Pro Glu Arg Gly Ala	Pro Phe Val Val Gln	Arg Ser Thr Ile Met	Glu			
	420	425	430			
Phe Glu His Pro Thr	Pro Arg Cys Leu His	Glu Pro Ala Gly	Ser Ala			
	435	440	445			
Phe Ser Leu Ala Cys Asp	Glu Glu His Leu Tyr Trp	Cys Glu Leu Ser				
	450	455	460			
Ala Gly Arg Leu Glu Leu	Trp Arg His Pro His	His Arg Pro Gly	Ala			
	465	470	475			480
Pro Ser Arg Phe Ala Tyr	Leu Gly Glu His Pro	Ile Ala Ala Thr	Trp			
	485	490	495			
Tyr Pro Ser Leu Thr	Leu Asn Ala Thr His	Val Leu Trp Ala	Asp Pro			

500 505 510
 Asp Arg Arg Ala Ile Leu Gly Val Asp Lys Arg Thr Gly Val Glu Pro
 515 520 525
 Ile Val Leu Ala Glu Thr Arg His Pro Pro Ala His Val Val Ser Glu
 530 535 540
 Asp Arg Asp Ile Phe Ala Leu Thr Gly Gln Pro Asp Ser Arg Asp Trp
 545 550 555 560
 His Val Glu His Ile Arg Ser Gly Ala Ser Thr Val Val Ala Asp Tyr
 565 570 575
 Gln Arg Gln Leu Trp Asp Arg Pro Asp Met Val Leu Asn Arg Arg Gly
 580 585 590
 Leu Phe Phe Thr Thr Asn Asp Arg Ile Leu Thr Leu Ala Arg Ser
 595 600 605

 <210> 10
 <211> 423
 <212> PRT
 <213> Sorangium cellulosum

 <400> 10
 Met Gly Ala Leu Ile Ser Val Ala Ala Pro Gly Cys Ala Leu Gly Gly
 1 5 10 15
 Ala Glu Glu Glu Gly Gln Pro Gly Gln Asp Ala Gly Ala Gly Ala Leu
 20 25 30
 Ala Pro Ala Arg Glu Val Met Ala Ala Glu Val Ala Ala Gly Gln Met
 35 40 45
 Pro Gly Ala Val Trp Leu Val Ala Arg Gly Asp Asp Val His Val Asp
 50 55 60
 Ala Val Gly Val Thr Glu Leu Gly Gly Ser Ala Pro Met Arg Arg Asp
 65 70 75 80
 Thr Ile Phe Arg Ile Ala Ser Met Thr Lys Ala Val Thr Ala Thr Ala
 85 90 95
 Val Met Met Leu Val Glu Glu Gly Lys Leu Asp Leu Asp Ser Pro Val
 100 105
 Asp Arg Trp Leu Pro Glu Leu Ala Asn Arg Lys Val Leu Ala Arg Ile
 115 120 125
 Asp Gly Pro Ile Asp Glu Thr Val Pro Ala Glu Arg Pro Ile Thr Val
 130 135 140
 Arg Asp Leu Met Thr Phe Thr Met Gly Phe Gly Ile Ser Phe Asp Ala
 145 150 155 160
 Ser Ser Pro Ile Gln Arg Ala Ile Asp Glu Leu Gly Leu Val Asn Ala
 165 170 175
 Gln Pro Val Pro Met Thr Pro His Gly Pro Asp Glu Trp Ile Arg Arg
 180 185 190
 Leu Gly Thr Leu Pro Leu Met His Gln Pro Gly Ala Gln Trp Met Tyr
 195 200 205

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Asn Thr Gly Ser Leu Val Gln Gly Val Leu Val Gly Arg Ala Ala Asp
210 215 220

Gln Gly Phe Asp Ala Phe Val Arg Glu Arg Ile Leu Ala Pro Leu Gly
225 230 235 240

Met Arg Asp Thr Asp Phe His Val Pro Ala Asp Lys Leu Ala Arg Phe
245 250 255

Ala Gly Cys Gly Tyr Phe Thr Asp Glu Gln Thr Gly Glu Lys Thr Arg
260 265 270

Met Asp Arg Asp Gly Ala Glu Ser Ala Tyr Ala Ser Pro Pro Ala Phe
275 280 285

Pro Ser Gly Ala Ala Gly Leu Val Ser Thr Val Asp Asp Tyr Leu Leu
290 295 300

Phe Ala Arg Met Leu Met Asn Gly Gly Val His Glu Gly Arg Arg Leu
305 310 315 320

Leu Ser Ala Ala Ser Val Arg Glu Met Thr Ala Asp His Leu Thr Pro
325 330 335

Ala Gln Lys Ala Ala Ser Ser Phe Phe Pro Gly Phe Phe Glu Thr His
340 345 350

Gly Trp Gly Tyr Gly Met Ala Val Val Thr Ala Pro Asp Ala Val Ser
355 360 365

Glu Val Pro Gly Arg Tyr Gly Trp Asp Gly Gly Phe Gly Thr Ser Trp
370 375 380

Ile Asn Asp Pro Gly Arg Glu Leu Ile Gly Ile Val Met Thr Gln Ser
385 390 395 400

Ala Gly Phe Leu Phe Ser Gly Ala Leu Glu Arg Phe Trp Arg Ser Val
405 410 415

Tyr Val Ala Thr Glu Ser Ala
420

<210> 11

<211> 713

<212> PRT

<213> Sorangium cellulosum

<400> 11

Met His Gly Leu Thr Glu Arg Gln Val Leu Leu Ser Leu Val Thr Leu
1 5 10 15

Ala Leu Ile Leu Val Thr Ala Arg Ala Ser Gly Glu Leu Ala Arg Arg
20 25 30

Leu Arg Gln Pro Glu Val Leu Gly Glu Leu Phe Gly Gly Val Val Leu
35 40 45

Gly Pro Ser Val Val Gly Ala Leu Ala Pro Gly Phe His Arg Ala Leu
50 55 60

Phe Gln Glu Pro Ala Val Gly Val Val Leu Ser Gly Ile Ser Trp Ile
65 70 75 80

Gly Ala Leu Leu Leu Leu Leu Met Ala Gly Ile Glu Val Asp Val Gly
85 90 95

Ile Leu Arg Lys Glu Ala Arg Pro Gly Ala Leu Ser Ala Leu Gly Ala
 100 105 110
 Ile Ala Pro Pro Leu Ala Ala Gly Ala Ala Phe Ser Ala Leu Val Leu
 115 120 125
 Asp Arg Pro Leu Pro Ser Gly Leu Phe Leu Gly Ile Val Leu Ser Val
 130 135 140
 Thr Ala Val Ser Val Ile Ala Lys Val Leu Ile Glu Arg Glu Ser Met
 145 150 155 160
 Arg Arg Ser Tyr Ala Gln Val Thr Leu Ala Ala Gly Val Val Ser Glu
 165 170 175
 Val Ala Ala Trp Val Leu Val Ala Met Thr Ser Ser Ser Tyr Gly Ala
 180 185 190
 Ser Pro Ala Leu Ala Val Ala Arg Ser Ala Leu Leu Ala Ser Gly Phe
 195 200 205
 Leu Leu Phe Met Val Leu Val Gly Arg Arg Leu Thr His Leu Ala Met
 210 215 220
 Arg Trp Val Ala Asp Ala Thr Arg Val Ser Lys Gly Gln Val Ser Leu
 225 230 235 240
 Val Leu Val Leu Thr Phe Leu Ala Ala Leu Thr Gln Arg Leu Gly
 245 250 255
 Leu His Pro Leu Leu Gly Ala Phe Ala Leu Gly Val Leu Leu Asn Ser
 260 265 270
 Ala Pro Arg Thr Asn Arg Pro Leu Leu Asp Gly Val Gln Thr Leu Val
 275 280 285
 Ala Gly Leu Phe Ala Pro Val Phe Phe Val Leu Ala Gly Met Arg Val
 290 295 300
 Asp Val Ser Gln Leu Arg Thr Pro Ala Ala Trp Gly Thr Val Ala Leu
 305 310 315 320
 Leu Leu Ala Thr Ala Thr Ala Ala Lys Val Val Pro Ala Ala Leu Gly
 325 330 335
 Ala Arg Leu Gly Leu Arg Gly Ser Glu Ala Ala Leu Val Ala Val
 340 345 350
 Gly Leu Asn Met Lys Gly Gly Thr Asp Leu Ile Val Ala Ile Val Gly
 355 360 365
 Val Glu Leu Gly Leu Leu Ser Asn Glu Ala Tyr Thr Met Tyr Ala Val
 370 375 380
 Val Ala Leu Val Thr Val Thr Ala Ser Pro Ala Leu Leu Ile Trp Leu
 385 390 395 400
 Glu Lys Arg Ala Pro Pro Thr Gln Glu Glu Ser Ala Arg Leu Glu Arg
 405 410 415
 Glu Glu Ala Ala Arg Arg Ala Tyr Ile Pro Gly Val Glu Arg Ile Leu
 420 425 430
 Val Pro Ile Val Ala His Ala Leu Pro Gly Phe Ala Thr Asp Ile Val
 435 440 445

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Glu Ser Ile Val Ala Ser Lys Arg Lys Leu Gly Glu Thr Val Asp Ile
 450 455 460
 Thr Glu Leu Ser Val Glu Gln Gln Ala Pro Gly Pro Ser Arg Ala Ala
 465 470 475 480
 Gly Glu Ala Ser Arg Gly Leu Ala Arg Leu Gly Ala Arg Leu Arg Val
 485 490 495
 Gly Ile Trp Arg Gln Arg Arg Glu Leu Arg Gly Ser Ile Gln Ala Ile
 500 505 510
 Leu Arg Ala Ser Arg Asp His Asp Leu Leu Val Ile Gly Ala Arg Ser
 515 520 525
 Pro Ala Arg Ala Arg Gly Met Ser Phe Gly Arg Leu Gln Asp Ala Ile
 530 535 540
 Val Gln Arg Ala Glu Ser Asn Val Leu Val Val Val Gly Asp Pro Pro
 545 550 555 560
 Ala Ala Glu Arg Ala Ser Ala Arg Arg Ile Leu Val Pro Ile Ile Gly
 565 570 575
 Leu Glu Tyr Ser Phe Ala Ala Ala Asp Leu Ala Ala His Val Ala Leu
 580 585 590
 Ala Trp Asp Ala Glu Leu Val Leu Leu Ser Ser Ala Gln Thr Asp Pro
 595 600 605
 Gly Ala Val Val Trp Arg Asp Arg Glu Pro Ser Arg Val Arg Ala Val
 610 615 620
 Ala Arg Ser Val Val Asp Glu Ala Val Phe Arg Gly Arg Arg Leu Gly
 625 630 635 640
 Val Arg Val Ser Ser Arg Val His Val Gly Ala His Pro Ser Asp Glu
 645 650 655
 Ile Thr Arg Glu Leu Ala Arg Ala Pro Tyr Asp Leu Leu Val Leu Gly
 660 665 670
 Cys Tyr Asp His Gly Pro Leu Gly Arg Leu Tyr Leu Gly Ser Thr Val
 675 680 685
 Glu Ser Val Val Val Arg Ser Arg Val Pro Val Ala Leu Leu Val Ala
 690 695 700
 His Gly Gly Thr Arg Glu Gln Val Arg
 705 710

<210> 12

<211> 126

<212> PRT

<213> Sorangium cellulosum

<400> 12

Met Asp Lys Pro Ile Gly Arg Thr Arg Cys Ala Ile Ala Glu Gly Tyr
 1 5 10 15

Ile Pro Gly Gly Ser Asn Gly Pro Glu Pro Gln Met Thr Ser His Glu
 20 25 30

Thr Ala Cys Leu Leu Asn Ala Ser Asp Arg Asp Ala Gln Val Ala Ile

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35 40 45

Thr Val Tyr Phe Ser Asp Arg Asp Pro Ala Gly Pro Tyr Arg Val Thr
50 55 60

Val Pro Ala Arg Arg Thr Arg His Val Arg Phe Asn Asp Leu Thr Glu
65 70 75 80

Pro Glu Pro Ile Pro Arg Asp Thr Asp Tyr Ala Ser Val Ile Glu Ser
85 90 95

Asp Ala Pro Ile Val Val Gln His Thr Arg Leu Asp Ser Arg Gln Ala
100 105 110

Glu Asn Ala Leu Leu Ser Thr Ile Ala Tyr Thr Asp Arg Glu
115 120 125

<210> 13

<211> 149

<212> PRT

<213> Sorangium cellulosum

<400> 13

Met Lys His Val Asp Thr Gly Arg Arg Phe Gly Arg Arg Ile Gly His
1 5 10 15

Thr Leu Gly Leu Leu Ala Ser Met Ala Leu Ala Gly Cys Gly Gly Pro
20 25 30

Ser Glu Lys Thr Val Gln Gly Thr Arg Leu Ala Pro Gly Ala Asp Ala
35 40 45

Arg Val Thr Ala Asp Val Asp Pro Asp Ala Ala Thr Thr Arg Leu Ala
50 55 60

Val Asp Val Val His Leu Ser Pro Pro Glu Arg Leu Glu Ala Gly Ser
65 70 75 80

Glu Arg Phe Val Val Trp Gln Arg Pro Ser Pro Glu Ser Pro Trp Arg
85 90 95

Arg Val Gly Val Leu Asp Tyr Asn Ala Asp Ser Arg Arg Gly Lys Leu
100 105 110

Ala Glu Thr Thr Val Pro Tyr Ala Asn Phe Glu Leu Leu Ile Thr Ala
115 120 125

Glu Lys Gln Ser Ser Pro Gln Ser Pro Ser Ser Ala Ala Val Ile Gly
130 135 140

Pro Thr Ser Val Gly
145

<210> 14

<211> 184

<212> PRT

<213> Sorangium cellulosum

<400> 14

Val Thr Ser Glu Glu Val Pro Gly Ala Ala Leu Gly Ala Gln Ser Ser
1 5 10 15

Leu Val Arg Ala Gln His Ala Ala Arg His Val Arg Pro Cys Thr Arg
20 25 30

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Ala Glu Glu Pro Pro Ala Leu Met His Gly Leu Thr Glu Arg Gln Val
 35 40 45

Leu Leu Ser Leu Val Ala Leu Ala Leu Val Leu Leu Thr Ala Arg Ala
 50 55 60

Phe Gly Glu Leu Ala Arg Arg Leu Arg Gln Pro Glu Val Leu Gly Glu
 65 70 75 80

Leu Phe Gly Gly Val Val Leu Gly Pro Ser Val Val Gly Ala Leu Ala
 85 90 95

Pro Gly Phe His Arg Val Leu Phe Gln Asp Pro Ala Val Gly Val Val
 100 105 110

Leu Ser Gly Ile Ser Trp Ile Gly Ala Leu Val Leu Leu Leu Met Ala
 115 120 125

Gly Ile Glu Val Asp Val Ser Ile Leu Arg Lys Glu Ala Arg Pro Gly
 130 135 140

Ala Leu Ser Ala Leu Gly Ala Ile Ala Pro Pro Leu Arg Thr Pro Gly
 145 150 155 160

Pro Leu Val Gln Arg Met Gln Gly Ala Phe Thr Trp Asp Leu Asp Val
 165 170 175

Ser Pro Arg Arg Ser Ala Gln Ala
 180

<210> 15

<211> 145

<212> PRT

<213> Sorangium cellulosum

<400> 15

Val Asn Ala Pro Cys Met Arg Cys Thr Ser Gly Pro Gly Val Arg Ser
 1 5 10 15

Gly Gly Ala Ile Ala Pro Ser Ala Glu Ser Ala Pro Gly Arg Ala Ser
 20 25 30

Leu Arg Arg Met Leu Thr Ser Thr Ser Ile Pro Ala Met Ser Ser Arg
 35 40 45

Thr Ser Ala Pro Ile Gln Glu Met Pro Glu Ser Thr Thr Pro Thr Ala
 50 55 60

Gly Ser Trp Lys Arg Thr Arg Trp Asn Pro Gly Ala Ser Ala Pro Thr
 65 70 75 80

Thr Asp Gly Pro Ser Thr Thr Pro Pro Lys Ser Ser Pro Ser Thr Ser
 85 90 95

Gly Trp Arg Ser Arg Arg Ala Ser Ser Pro Lys Ala Arg Ala Val Arg
 100 105 110

Arg Thr Ser Ala Arg Ala Thr Ser Glu Ser Arg Thr Cys Arg Ser Val
 115 120 125

Arg Pro Cys Ile Arg Ala Gly Gly Ser Ser Ala Arg Val Gln Gly Arg
 130 135 140

Thr

145

<210> 16
 <211> 185
 <212> PRT
 <213> Sorangium cellulosum

<400> 16
 Val Leu Ala Pro Pro Ala Asp Ile Arg Pro Pro Ala Ala Ala Gln Leu
 1 5 10 15
 Glu Pro Asp Ser Pro Asp Asp Glu Ala Asp Glu Ala Asp Glu Ala Leu
 20 25 30
 Arg Pro Phe Arg Asp Ala Ile Ala Ala Tyr Ser Glu Ala Val Arg Trp
 35 40 45
 Ala Glu Ala Ala Gln Arg Pro Arg Leu Glu Ser Leu Val Arg Leu Ala
 50 55 60
 Ile Val Arg Leu Gly Lys Ala Leu Asp Lys Val Pro Phe Ala His Thr
 65 70 75 80
 Thr Ala Gly Val Ser Gln Ile Ala Gly Arg Leu Gln Asn Asp Ala Val
 85 90 95
 Trp Phe Asp Val Ala Ala Arg Tyr Ala Ser Phe Arg Ala Ala Thr Glu
 100 105 110
 His Ala Leu Arg Asp Ala Ala Ser Ala Met Glu Ala Leu Ala Ala Gly
 115 120 125
 Pro Tyr Arg Gly Ser Ser Arg Val Ser Ala Ala Val Gly Glu Phe Arg
 130 135 140
 Gly Glu Ala Ala Arg Leu His Pro Ala Asp Arg Val Pro Ala Ser Asp
 145 150 155 160
 Gln Gln Ile Leu Thr Ala Leu Arg Ala Ala Glu Arg Ala Leu Ile Ala
 165 170 175
 Leu Tyr Thr Ala Phe Ala Arg Glu Glu
 180 185

<210> 17
 <211> 146
 <212> PRT
 <213> Sorangium cellulosum

<400> 17
 Met Ala Asp Ala Ala Ser Arg Ser Ala Cys Ser Val Ala Ala Arg Lys
 1 5 10 15
 Leu Ala Tyr Arg Ala Ala Thr Ser Asn Gln Thr Ala Ser Phe Trp Ser
 20 25 30
 Leu Pro Ala Ile Trp Glu Thr Pro Ala Val Val Cys Ala Lys Gly Thr
 35 40 45
 Leu Ser Ser Ala Leu Pro Ser Arg Thr Ile Ala Ser Arg Thr Arg Leu
 50 55 60
 Ser Ser Arg Gly Arg Cys Ala Ala Ser Ala His Arg Thr Ala Ser Glu
 65 70 75 80

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Tyr Ala Ala Ile Ala Ser Arg Asn Gly Arg Ser Ala Ser Ser Ala Ser
 85 90 95
 Ser Ala Ser Ser Ser Gly Glu Ser Gly Ser Ser Trp Ala Ala Ala Gly
 100 105 110
 Gly Arg Met Ser Ala Gly Gly Ala Ser Thr Gly Glu Val Tyr Glu Gln
 115 120 125
 Ala Pro Arg Leu Arg Leu Ala Gln Ser Val Ala Ala Arg Arg Arg Asp
 130 135 140
 Pro Thr
 145

<210> 18
 <211> 288
 <212> PRT
 <213> Sorangium cellulosum

<400> 18
 Val Thr Val Ser Ser Met Pro Arg Ser Trp Ser Ser Arg Val Arg Thr
 1 5 10 15
 Val Val Thr Ala Leu Gly Cys Ala Arg Arg Leu Ser Gly Ser Ile Ser
 20 25 30
 Arg Leu Arg Arg His Pro Glu Ala Gly Arg Ala Pro Arg Ser Arg Leu
 35 40 45
 Arg Ala Trp Arg Arg Leu Pro Gln His Ile Ser Ser Pro Trp Arg His
 50 55 60
 Leu Pro Pro Gly Ala Arg Val Gly Thr Ser Cys Pro Ala Asp Arg Arg
 65 70 75 80
 Ile Leu Pro Ser His Arg Thr Ala Asp Leu Gly Thr Ser Gly Gly Thr
 85 90 95
 Leu Val Ala Arg Met Ser Gly His Val Ala Arg Asn Pro His Ala Ala
 100 105 110
 Val Leu Val Gly Asp Gly Ser Ala Arg Gly Arg Arg Arg Leu Ser Asn
 115 120 125
 Arg Arg Ala Glu Arg Arg Val Ser Asp Val Thr Cys Arg Glu Gly Gly
 130 135 140
 Glu Ala Met Gln Lys Ile Ala Gly Lys Leu Val Val Gly Leu Ile Ser
 145 150 155 160
 Val Ser Gly Met Ser Leu Leu Ala Ala Cys Gly Gly Glu Lys Arg Ser
 165 170 175
 Gly Gly Glu Ala Gln Thr Pro Gly Gly Ala Gln Gly Glu Ala Pro Val
 180 185 190
 Pro Val Gly Ser Ala Val Asp Ser Ile Val Ala Ala Arg Cys Asp Arg
 195 200 205
 Glu Ala Arg Cys Asn Asn Ile Gly Gln Asp Arg Glu Tyr Ser Ser Lys
 210 215 220
 Asp Ala Cys Ser Asn Lys Ile Arg Ser Glu Trp Arg Asp Glu Leu Thr

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225		230		235		240
Phe Gly Glu Cys	Pro Gly Gly Ile Asp	Ala Lys Gln Leu Asn	Glu Cys			
	245		250			255
Leu Glu Gly Ile	Arg Asn Glu Gly Cys	Gly Asn Pro Phe Asp	Thr Leu			
	260		265			270
Gly Arg Val Val	Ala Cys Arg Ser	Ser Asp Leu Cys	Arg Asp Ala Arg			
	275		280			285

<210> 19
 <211> 288
 <212> PRT
 <213> Sorangium cellulosum

<400> 19
 Val Thr Val Ser Ser Met Pro Arg Ser Trp Ser Ser Arg Val Arg Thr
 1 5 10 15
 Val Val Thr Ala Leu Gly Cys Ala Arg Arg Leu Ser Gly Ser Ile Ser
 20 25 30
 Arg Leu Arg Arg His Pro Glu Ala Gly Arg Ala Pro Arg Ser Arg Leu
 35 40 45
 Arg Ala Trp Arg Arg Leu Pro Gln His Ile Ser Ser Pro Trp Arg His
 50 55 60
 Leu Pro Pro Gly Ala Arg Val Gly Thr Ser Cys Pro Ala Asp Arg Arg
 65 70 75 80
 Ile Leu Pro Ser His Arg Thr Ala Asp Leu Gly Thr Ser Gly Gly Thr
 85 90 95
 Leu Val Ala Arg Met Ser Gly His Val Ala Arg Asn Pro His Ala Ala
 100 105 110
 Val Leu Val Gly Asp Gly Ser Ala Arg Gly Arg Arg Leu Ser Asn
 115 120 125
 Arg Arg Ala Glu Arg Arg Val Ser Asp Val Thr Cys Arg Glu Gly Gly
 130 135 140
 Glu Ala Met Gln Lys Ile Ala Gly Lys Leu Val Val Gly Leu Ile Ser
 145 150 155 160
 Val Ser Gly Met Ser Leu Leu Ala Ala Cys Gly Gly Glu Lys Arg Ser
 165 170 175
 Gly Gly Glu Ala Gln Thr Pro Gly Gly Ala Gln Gly Glu Ala Pro Val
 180 185 190
 Pro Val Gly Ser Ala Val Asp Ser Ile Val Ala Ala Arg Cys Asp Arg
 195 200 205
 Glu Ala Arg Cys Asn Asn Ile Gly Gln Asp Arg Glu Tyr Ser Ser Lys
 210 215 220
 Asp Ala Cys Ser Asn Lys Ile Arg Ser Glu Trp Arg Asp Glu Leu Thr
 225 230 235 240

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Phe Gly Glu Cys Pro Gly Gly Ile Asp Ala Lys Gln Leu Asn Glu Cys
 245 250 255
 Leu Glu Gly Ile Arg Asn Glu Gly Cys Gly Asn Pro Phe Asp Thr Leu
 260 265 270
 Gly Arg Val Val Ala Cys Arg Ser Ser Asp Leu Cys Arg Asp Ala Arg
 275 280 285

<210> 20
 <211> 155
 <212> PRT
 <213> Sorangium cellulosum

<400> 20
 Met Asp Pro Arg Ala Arg Arg Glu Lys Arg Pro Ser Leu Leu Asp Ser
 1 5 10 15
 Arg Gly Arg Gln Pro Lys Arg Ser Gln Gln Gly Gly His Met Glu Lys
 20 25 30
 Pro Ile Gly Arg Thr Arg Trp Ala Ile Ala Glu Gly Tyr Ile Pro Gly
 35 40 45
 Arg Ser Asn Gly Pro Glu Pro Gln Met Thr Ser His Glu Thr Ala Cys
 50 55 60
 Leu Leu Asn Ala Ser Asp Arg Asp Ala Gln Val Ala Ile Thr Val Tyr
 65 70 75 80
 Phe Ser Asp Arg Asp Pro Ala Gly Pro Tyr Arg Val Thr Val Pro Ala
 85 90 95
 Arg Arg Thr Arg His Val Arg Phe Asn Asp Leu Thr Glu Pro Glu Pro
 100 105 110
 Ile Pro Arg Asp Thr Asp Tyr Ala Ser Val Ile Glu Ser Asp Val Pro
 115 120 125
 Ile Val Val Gln His Thr Arg Leu Asp Ser Arg Gln Ala Glu Asn Ala
 130 135 140
 Leu Ile Ser Thr Ile Ala Tyr Thr Asp Arg Glu
 145 150 155

<210> 21
 <211> 156
 <212> PRT
 <213> Sorangium cellulosum

<400> 21
 Val Arg Arg Ser Arg Trp Gln Met Lys His Val Asp Thr Gly Arg Arg
 1 5 10 15
 Val Gly Arg Arg Ile Gly Leu Thr Leu Gly Leu Leu Ala Ser Met Ala
 20 25 30
 Leu Ala Gly Cys Gly Gly Pro Ser Glu Lys Ile Val Gln Gly Thr Arg
 35 40 45
 Leu Ala Pro Gly Ala Asp Ala His Val Ala Ala Asp Val Asp Pro Asp

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50

55

60

Ala Ala Thr Thr Arg Leu Ala Val Asp Val Val His Leu Ser Pro Pro
65 70 75 80

Glu Arg Ile Glu Ala Gly Ser Glu Arg Phe Val Val Trp Gln Arg Pro
85 90 95

Ser Ser Glu Ser Pro Trp Gln Arg Val Gly Val Leu Asp Tyr Asn Ala
100 105 110

Ala Ser Arg Arg Gly Lys Leu Ala Glu Thr Thr Val Pro His Ala Asn
115 120 125

Phe Glu Leu Leu Ile Thr Val Glu Lys Gln Ser Ser Pro Gln Ser Pro
130 135 140

Ser Ser Ala Ala Val Ile Gly Pro Thr Ser Val Gly
145 150 155

<210> 22

<211> 305

<212> PRT

<213> Sorangium cellulosum

<400> 22

Met Glu Lys Glu Ser Arg Ile Ala Ile Tyr Gly Ala Ile Ala Ala Asn
1 5 10 15

Val Ala Ile Ala Ala Val Lys Phe Ile Ala Ala Ala Val Thr Gly Ser
20 25 30

Ser Ala Met Leu Ser Glu Gly Val His Ser Leu Val Asp Thr Ala Asp
35 40 45

Gly Leu Leu Leu Leu Gly Lys His Arg Ser Ala Arg Pro Pro Asp
50 55 60

Ala Glu His Pro Phe Gly His Gly Lys Glu Leu Tyr Phe Trp Thr Leu
65 70 75 80

Ile Val Ala Ile Met Ile Phe Ala Ala Gly Gly Val Ser Ile Tyr
85 90 95

Glu Gly Ile Leu His Leu Leu His Pro Arg Gln Ile Glu Asp Pro Thr
100 105 110

Trp Asn Tyr Val Val Leu Gly Ala Ala Ala Val Phe Glu Gly Thr Ser
115 120 125

Leu Ile Ile Ser Ile His Glu Phe Lys Lys Lys Asp Gly Gln Gly Tyr
130 135 140

Leu Ala Ala Met Arg Ser Ser Lys Asp Pro Thr Phe Thr Ile Val
145 150 155 160

Leu Glu Asp Ser Ala Ala Leu Ala Gly Leu Thr Ile Ala Phe Leu Gly
165 170 175

Val Trp Leu Gly His Arg Leu Gly Asn Pro Tyr Leu Asp Gly Ala Ala
180 185 190

Ser Ile Gly Ile Gly Leu Val Leu Ala Ala Val Ala Val Phe Leu Ala
195 200 205

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Ser Gln Ser Arg Gly Leu Leu Val Gly Glu Ser Ala Asp Arg Glu Leu
 210 215 220

Leu Ala Ala Ile Arg Ala Leu Ala Ser Ala Asp Pro Gly Val Ser Ala
 225 230 235 240

Val Gly Arg Pro Leu Thr Met His Phe Gly Pro His Glu Val Leu Val
 245 250 255

Val Leu Arg Ile Glu Phe Asp Ala Ala Leu Thr Ala Ser Gly Val Ala
 260 265 270

Glu Ala Ile Glu Arg Ile Glu Thr Arg Ile Arg Ser Glu Arg Pro Asp
 275 280 285

Val Lys His Ile Tyr Val Glu Ala Arg Ser Leu His Gln Arg Ala Arg
 290 295 300

Ala
 305

<210> 23
 <211> 135
 <212> PRT
 <213> Sorangium cellulosum

<400> 23
 Val Gln Thr Ser Ser Phe Asp Ala Arg Tyr Ala Gly Cys Lys Ser Ser
 1 5 10 15

Arg Arg Ile Ala Arg Ser Gly Ser Ala Gly Ala Arg Ala Gly Arg Ala
 20 25 30

His Glu Gly Ala Ala Ser Ala Gly Phe Glu Gly Gly Asp Val Met Arg
 35 40 45

Lys Ala Arg Ala His Gly Ala Met Leu Gly Gly Arg Asp Asp Gly Trp
 50 55 60

Arg Arg Gly Leu Pro Gly Ala Gly Ala Leu Arg Ala Ala Leu Gln Arg
 65 70 75 80

Gly Arg Ser Arg Asp Leu Ala Arg Arg Arg Leu Ile Ala Ser Val Ser
 85 90 95

Leu Ala Gly Gly Ala Ser Met Ala Val Ser Leu Phe Gln Leu Gly
 100 105 110

Ile Ile Glu Arg Leu Pro Asp Pro Pro Leu Pro Gly Phe Asp Ser Ala
 115 120 125

Lys Val Thr Ser Ser Asp Ile
 130 135

<210> 24
 <211> 19
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: universal
 reverse primer

<400> 24

ggaaacagct atgaccatg 19

<210> 25
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: universal forward primer

<400> 25
gtaaaacgac ggccagt 17

<210> 26
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: PCR primer NH24 end "B"

<400> 26
gtgactggcg cctggaatct gcatgagc 28

<210> 27
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: PCR primer NH2 end "A"

<400> 27
agcgggagct tgctagacat tctgtttc 28

<210> 28
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: PCR primer NH2 end "B"

<400> 28
gacgcgcctc gggcagcgcc ccaa 24

<210> 29
<211> 25
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: PCR primer pEPO15-NH6 end "B"

<400> 29
caccgaagcg tcgatctggt ccatac 25

<210> 30
<211> 25
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: PCR primer
pEPO15H2.7 end "A"

<400> 30

cggtcagatc gacgacgggc tttec

25